

GEOGRAPHY
OF TEXAS &
SIMONDS



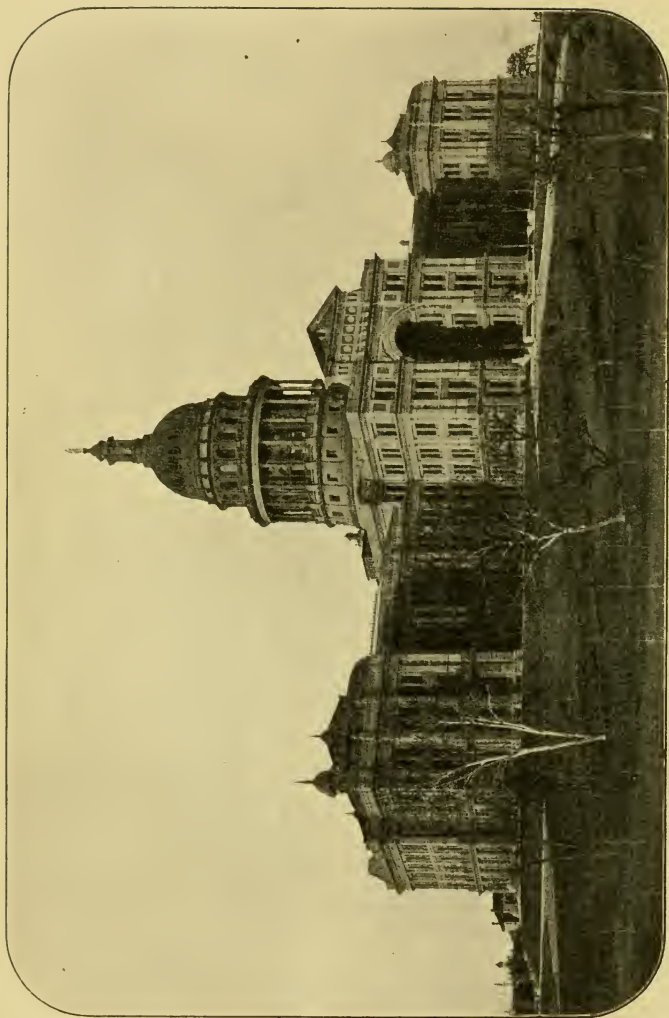
Class F386

Book 559

Copyright N^o

COPYRIGHT DEPOSIT.





THE STATE CAPITOL AT AUSTIN

This magnificent building is, inclusive of porticoes, 566 feet 6 inches long; its greatest width is 288 feet 10 inches; and its height from the grade line to the top of the statue on the dome 311 feet

THE
GEOGRAPHY OF TEXAS

PHYSICAL AND POLITICAL

BY

FREDERIC WILLIAM SIMONDS, PH.D.

PROFESSOR OF GEOLOGY IN THE UNIVERSITY
OF TEXAS

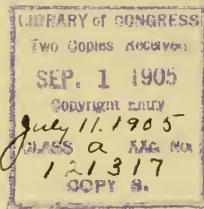
The educated citizen should know the state in which he lives

GINN & COMPANY

BOSTON · NEW YORK · CHICAGO · LONDON

F386

.S59



COPYRIGHT, 1905, BY
FREDERIC WILLIAM SIMONDS

ALL RIGHTS RESERVED

55.8



The Athenæum Press
GINN & COMPANY • PRO-
PRIETORS • BOSTON • U.S.A.

PREFATORY NOTE

In the preparation of this text, which necessarily covers a somewhat varied field, I have, in general, been guided by the following works:

ON PHYSICAL GEOGRAPHY AND GEOLOGY

The Reports of the Geological Survey of Texas, under the direction of E. T. Dumble, state geologist. Austin, 1890-1893.

"Notes on the Physical Geography of Texas," by Ralph S. Tarr. *Proceedings of the Academy of Natural Sciences*. Philadelphia, August 29, 1893.

"The Physical Geography of the Texas Region," by Robert T. Hill. Folio 3 of the *Topographic Atlas of the United States*. Washington, United States Geological Survey, 1900.

"Physical Geography, Geology, and Resources of Texas," by E. T. Dumble. Chapter IV, Volume 2, of *A Comprehensive History of Texas*, edited by Dudley G. Wooten. Dallas, William G. Scarff, 1898.

"The Geology of the Edwards Plateau and the Rio Grande Plain adjacent to Austin and San Antonio, Texas," by Robert T. Hill and T. Wayland Vaughan. *Eighteenth Annual Report of the United States Geological Survey*, Part II, pp. 193-321. Washington, 1898.

"Geography and Geology of the Black and Grand Prairies, Texas," by Robert T. Hill. *Twenty-First Annual Report of the United States Geological Survey*, Part VII. Washington, 1901.

"A Gazetteer of Texas" (second edition), by Henry Gannett. *Bulletin of the United States Geological Survey*, No. 224 (Series F, Geography, 36). Washington, 1904.

ON WATER POWER AND IRRIGATION

"The Water Power of Texas," by Thomas U. Taylor, C.E., M.C.E. *Transactions of the Texas Academy of Science*, Volume IV, Part II, No. 4. Austin, 1902.

"Irrigation Systems in Texas," by William Ferguson Hutson. *Water-Supply and Irrigation Papers of the United States Geological Survey*, No. 13. Washington, 1898.

"Rapid Progress in Irrigation," article in the *Texas Almanac and State Industrial Guide* for 1904. Published by the *Galveston-Dallas News*.

"Rice Irrigation in Texas," by Thomas U. Taylor. *Bulletin of The University of Texas*, No. 16. Austin, 1902.

"Rice Growing on the Coastal Prairies," article in the *Texas Almanac and State Industrial Guide* for 1904. Published by the *Galveston-Dallas News*.

ON CLIMATE

"The Climatic Conditions of Texas, especially with Reference to Temperature and Rainfall." *Report of the Chief Signal Officer [A. W. Greely] of the Army*. Fifty-Second Congress, First Session, Executive Document No. 5. Washington, 1892.

"The Climate of Texas," by Isaac Monroe Cline, M.A., M.D. United States Department of Agriculture, Weather Bureau, Texas Weather Service, Special Bulletin No. 4. Galveston, 1894.

ON VEGETATION

"The Ecological Relations of the Vegetation of Western Texas," by Dr. William L. Bray. Contributions from the Hull Botanical Laboratory, XXX. *The Botanical Gazette*, Chicago, Volume 32, August, September, and October, 1901.

"Texas Forests and the Problems of Forest Management for the Long-Leaf Pine Lands," by Dr. William L. Bray. *The Forester*, Volume 7, pp. 131-138. Washington, June 7, 1901.

"The Timber Pines of the Southern United States," by Charles Mohr, Ph.D. Bulletin No. 13, United States Department of Agriculture, Division of Forestry. Washington, 1896.

"Forest Resources of Texas," by William L. Bray. Bulletin No. 47, United States Department of Agriculture, Division of Forestry. Washington, 1904.

"The Timber of the Edwards Plateau of Texas," by William L. Bray. Bulletin No. 49, United States Department of Agriculture, Division of Forestry. Washington, 1904.

ON FAUNA

"American Animals," by Witmer Stone and William Everitt Cram. New York: Doubleday, Page & Co., 1902.

"Handbook of Birds of the Western United States," by Florence Merriam Bailey. Boston and New York: Houghton, Mifflin & Co., 1902.

"Key to North American Birds," by Elliott Coues. Boston: Dana Estes & Co., 1903.

"The Crocodilians, Lizards, and Snakes of North America," by Edward Drinker Cope. *Report of the United States National Museum for 1898*, pp. 153-1270. Washington, 1900.

"The Poisonous Snakes of North America," by Leonhard Stejneger. *Report of the United States National Museum for the Year ending June 30, 1893*, Part II, pp. 337-487. Washington, 1895.

"The Poisonous Snakes of Texas, with Notes on their Habits," by J. D. Mitchell. *Transactions of the Texas Academy of Science*, Volume V, pp. 19-48. Austin, 1903.

ON MINERAL RESOURCES

The Reports of the Geological Survey of Texas, under the direction of E. T. Dumble, state geologist. Austin, 1890-1893.

Bulletins 1-5, inclusive, of The University of Texas Mineral Survey, William B. Phillips, director. Austin, 1901-1902.

The Mineral Industry, edited by Richard P. Rothwell. New York: The Scientific Publishing Company, 1893-1900.

ON HISTORY

"Historical Sketch of Texas," by George Pierce Garrison, Ph.D. Chapter II of *The Government of the People of the State of Texas*. Philadelphia: Eldredge and Brother, 1900.

Texas a Contest of Civilizations, by George P. Garrison. Boston and New York: Houghton, Mifflin & Co., 1903.

ON GOVERNMENT

The Constitution of the State of Texas.

The Government of the People of the State of Texas, by George Pierce Garrison, Ph.D. Philadelphia: Eldredge and Brother, 1902.

ON EDUCATIONAL INSTITUTIONS

Official Reports.

ON RAILROADS

Reports of the Railroad Commission of the State of Texas.

"The Railroads of Texas, with Glimpses of the Country through which they pass." The *Texas Almanac* for 1868, pp. 118-146. Galveston, 1868.

"The Development of the Present Texas Railway System," by R. A. Thompson, Assoc. M. Am. Soc. C. E., chief engineer, Railroad Commission of Texas. *Transactions of the Texas Academy of Science*, Volume IV, Part I, pp. 57-80. Austin, 1901.

ON POPULATION, AGRICULTURE, AND MANUFACTURES

Reports of the Twelfth Census.

I desire to record here my indebtedness to my colleague, Dr. George P. Garrison, and to the Hon. R. L. Batts, of the Austin bar, for valuable suggestions relating to history, government, and education; also my indebtedness to

Dr. H. Y. Benedict, for substantial aid in selecting representatives of the bird fauna, and to Mr. R. A. Thompson, chief engineer, and Mr. H. G. Askew, auditor, of the Railroad Commission of Texas, for assistance in the preparation of the railroad statistics. I am furthermore indebted to Dr. William B. Phillips, late director of The University of Texas Mineral Survey; to Dr. William L. Bray, head of the School of Botany; to Dr. A. M. Spurgin; and to Mr. J. M. Kuehne for the use of many excellent photographs, reproductions of which appear among the illustrations. My thanks are also due to my assistant, Mr. Alexander Deussen, for suggestions and help such as can only be given by one closely associated with the writer in his work; to Mrs. Grace Murray Stephenson for the final reading of the manuscript; and to Dr. H. E. Bolton for expert advice covering numerous difficult points. Many of the diagrams, tracings, and maps used in the text have been skillfully drawn by Mr. John W. Pritchett, a student of the Engineering Department of the University.

FREDERIC W. SIMONDS

SCHOOL OF GEOLOGY
THE UNIVERSITY OF TEXAS
July, 1905

CONTENTS

	PAGES
CHAPTER I.—THE STATE—Introduction—Location— Boundaries—Area—Political Divisions—Cities and Towns	1-5
CHAPTER II.—GEOLOGY—The Relation of Geology to Physical Geography—Kinds of Rocks—Sedimentary Rocks—Igneous Rocks—Altered or Metamorphic Rocks—The Rocks of Texas—The Geological Map —Recent and Neocene Systems—Eocene System— Cretaceous System—Jura-Trias System—Permian System—Carboniferous System—Ordovician and Cambrian Systems—Archean System	6-14
CHAPTER III.—RELIEF AND SOILS—Classification of Relief—Region of the Gulf Slope—The Coastal Plain—The Forested Area—The Rio Grande Plain —The Black and Grand Prairies—Region of the Central Basin—Region of the Plateaus—Region of Mountains and Basins—Soils—Residual Soils— Transported Soils	15-30
CHAPTER IV.—SURFACE AND UNDERGROUND WATERS —Kinds of Drainage—The Gradient of Some Texas Rivers—Navigation of Rivers—Lakes—Water Power —Irrigation—Artesian Water—Springs	31-38
CHAPTER V.—CLIMATE—Rainfall—The Distribution of Rainfall by Months—Temperature—Cold Waves, or “Northers”—Winds—Sunshine	39-48
CHAPTER VI.—VEGETATION—General Statement— Forests—The East Texas Timber Belt—The Post Oak Country and the Cross Timbers—The Forest Growth of the Edwards Plateau—The Trans-Pecos	

Forest Growth—Vegetation of the Coast Prairie— Vegetation of the Rio Grande Plain—Vegetation of the Prairie Plains and the Plateaus—Life Zones— Characteristic Plants and Animals.	PAGES 49-62
CHAPTER VII.—FAUNA—The Animal Life of Texas —Mammals—Birds—Reptiles and Amphibians— Fishes—Invertebrates	63-81
CHAPTER VIII.—INDUSTRIES—Agriculture—Cotton —Cereals—Fruit and Vegetables—Nuts—Other Agricultural Products—Stock Raising—Wool Grow- ing—Poultry, Honey, and Wax—Manufacturing— Manufacturing Industries	83-95
CHAPTER IX.—MINERAL RESOURCES—Coal and Lign- ite—Oil (Petroleum)—Asphaltum (Mineral Pitch) —Natural Gas—Iron Ores—Quicksilver or Mercury —Gold and Silver—Copper and Lead—Salt—Sul- phur—Gypsum, Lime, and Cement Rocks—Clay— Building and Ornamental Stones—Fertilizers	96-111
CHAPTER X.—RAILROADS—The Pioneer Railroads— Railroad Construction during and since the Civil War —Railroad Systems: Southern Pacific System; Gould System; Santa Fé System; "Katy" (Missouri, Kansas, and Texas) System; Denver System; Rock Island Sys- tem; "Frisco" System—Other Railroads	112-120
CHAPTER XI.—IMPORTANT EVENTS IN TEXAS HISTORY —Early Attempts at Settlement—French and Span- ish Claims. The Missions—Spanish Rule and the Anglo-American—The Louisiana-Texas Boundary. Magee's Invasion—Lafitte—Long's Invasion—Aus- tin's Colony—Mexican Irritation—The Texas Revolu- tion—The Alamo, Goliad, and San Jacinto—The Republic of Texas—The State of Texas	121-129
CHAPTER XII.—THE GOVERNMENT—The Legislative Department—The Executive Department—The Judi- cial Department—Presidents of the Republic of Texas —Governors of the State of Texas	130-133

	PAGES
CHAPTER XIII. — EDUCATION — The Public Schools — The Permanent School Fund — The Perpetual School Fund — The Available School Fund — Sam Houston Normal Institute — North Texas State Normal Col- lege — Southwest Texas Normal School — Prairie View State Normal and Industrial College — The Girls In- dustrial College — The Agricultural and Mechanical College of Texas — The University of Texas — The University Endowment — Denominational Colleges — Libraries — Eleemosynary Institutions — Penal In- stitutions	134-148
CHAPTER XIV. — POPULATION — General Statement — Elements of Population — Native White Population — Colored Population — Foreign-Born Population . .	149-155
CHAPTER XV. — THE PRINCIPAL CITIES OF TEXAS — San Antonio — Dallas — Houston — Galveston — Fort Worth — Austin — Waco — El Paso — Laredo — Denison — Sherman — Beaumont	157-195
CHAPTER XVI. — CITIES AND TOWNS HAVING BETWEEN FIVE AND TEN THOUSAND INHABITANTS — Paris — Corsicana — Palestine — Tyler — Gainesville — Mar- shall — Cleburne — Temple — Greenville — Terrell — Brownsville — Brenham — Hillsboro — Texarkana — Bonham	196-204
CHAPTER XVII. — CITIES AND TOWNS HAVING BETWEEN TWENTY-FIVE HUNDRED AND FIVE THOUSAND IN- HABITANTS — Ennis — Weatherford — Corpus Christi — McKinney — Gonzales — Waxahachie — Taylor — Denton — Victoria — Brownwood — Navasota — Orange — Belton — Sulphur Springs — Longview — Bryan — Yoakum — Cuero — Abilene — Cameron — Calvert — Marlin — Jefferson — Georgetown — San Angelo — Crockett — Bowie — Smithville — Rockdale	205-216
APPENDIX — THE COUNTIES OF TEXAS: Name, Area, Population, and County Seat	217-224
INDEX	225-237

LIST OF ILLUSTRATIONS

The State Capitol at Austin	<i>Frontispiece</i>
FIG.	PAGE
1. Fragment of Limestone showing <i>Patellina texana</i>	7
2. Geological Map of Texas	9
3. Diagram illustrating the Arrangement of Strata in the Gulf Slope	10
4. White Drifting Sands in Ward County	11
5. Ram's-Horn Oyster	12
6. A Relief Map of Texas	16
7. Delta Shore Lines of the Texas Coast	17
8. Delta and Distributaries of Trinity River	18
9. Ideal Section in Eastern Part of the Forested Area	19
10. View on the Plains between Childress and Matador	21
11. Childress. "A City of the Plains"	22
12. Scene on Stockton Plateau. Fort Stockton in the Distance	23
13. Scarp of the Staked Plains, Blanco Canyon, Crosby County	24
14. Northeast Point of Chisos Mountains, Brewster County	25
15. East End of Elephant Head, Brewster County	26
16. Study Butte, Brewster County	26
17. Black Mesa, Brewster County	27
18. View towards the Foothills of Quitman Mountains	28
19. Pump Canyon, Rio Grande at Langtry	33
20. Casa Canyon, near Devil River	33
21. Marble Falls on the Colorado River. A Natural Dam	35
22. Artesian Well on Bosque Farm, Four Miles West of Waco	36
23. Map showing the Artesian Water Areas of Texas	37
24. Map of Texas showing the Mean Annual Rainfall in Inches	40
25. Diagram of the Mean Monthly Rainfall at Six Stations	41
26. Map of Texas showing the Mean Annual Temperature and the Iron and Quicksilver Areas	43
27. Eighty-Five Varieties of Texas Cacti	50

FIG.	PAGE
28. Map of Texas showing the Wooded Areas	51
29. Swamp and Bayou Scene near Beaumont	53
30. Palmetto and Oak Growth on the East Fork of San Jacinto River	53
31. Long-Leaf Pine Forest of the Louisiana-Texas Area	54
32. Cedar Growth on Hill West of Shoal Creek, Austin . . .	56
33. Rocky Mountain Cedars and Oaks on the Summit of Chisos Mountains, Brewster County	57
34. Cottonwood Timber, Saucito, Presidio County	57
35. Live Oak Motte, West of Austin	58
36. The Staked Plains. Yucca and Grass	59
37. Map of Texas showing the Life Zones	61
38. Mexican Boll Weevil	64
39. Nine-Banded Armadillo	65
40. Texas Peccary or Wild Hog	65
41. American Bison or Buffalo	66
42. Mocking Bird	68
43. Cardinal or Redbird	68
44. Lark Sparrow or Lark Finch	68
45. Scissor-Tailed Flycatcher	68
46. Texas Bob White	70
47. Killdeer	70
48. Ring-Billed Gull	72
49. Horned Lizard	73
50. Harlequin or Coral Snake	75
51. Cottonmouth or Water Moccasin	76
52. Edwards' Massasauga	76
53. Texas Rattlesnake	77
54. Channel or Eel Cat	79
55. Yellow or Mud Cat	79
56. Large-Mouthed Black Bass	79
57. Red Snapper	80
58. Southern Flounder	80
59. Cotton in the Railroad Yard at Houston	82
60. Cotton Crop of the United States, Season of 1902-1903 .	84
61. Map of the Texas Cotton Belt	85
62. A Texas Cotton Field	86

FIG.	PAGE
63. Map of Texas showing the Rice Belt and the East Texas Fruit Region	87
64. Japanese Rice Farmers near Port Lavaca, Calhoun County	89
65. Rice Threshing at Raywood, Liberty County	89
66. Texas Cowboys	91
67. Cattle at a Water Tank on the Plains	91
68. Diagrammatic Illustration of the Number of Neat Cattle in the Leading States	92
69. A West Texas Ranch House	92
70. A Pecos County Ranch House	93
71. Angora Goats, Boquillas, Brewster County	93
72. Map of the North Texas Coal Field	97
73. A Texas Coal Mine, Thurber, Erath County	98
74. Map of Texas showing the Lignite, Coal, and Petroleum Areas	99
75. The Beatty Gusher, Beaumont Oil Field, 1901	100
76. Scene in the Sourlake Oil Field, Hardin County	101
77. A Burning Gas Well near Corsicana	103
78. The Terlingua Mining Company's Furnace (Quicksilver), Terlingua, Brewster County	104
79. Quarry at Granite Mountain, Burnet County	109
80. A Part of the Pecos River Viaduct	116
81. The Alamo, San Antonio	127
82. Sam Houston Normal Institute, Main Building, Huntsville	136
83. Sam Houston Normal Institute, Peabody Library Building	136
84. North Texas State Normal College, Denton	137
85. Southwest Texas State Normal School, San Marcos	138
86. Girls Industrial College of Texas, Denton	139
87. View of a Part of the Campus of the Agricultural and Mechanical College	140
88. Agricultural Building, Agricultural and Mechanical College	141
89. The University of Texas, Main University at Austin	142
90. The University of Texas, Medical Department at Galveston	143
91. A Partial View of the State Institution for the Blind, Austin	146
92. Deaf and Dumb Asylum (Texas School for the Deaf), Austin	146

FIG.	PAGE
93. State Insane Asylum, Austin	147
94. Southwestern Insane Asylum, San Antonio	147
95. Diagrammatic Illustration of the Increase of Population in the State, 1850-1900	149
96. Map of Texas showing the Distribution of the Negro Pop- ulation by Counties	151
97. Map of Texas showing the Distribution of the Mexican Population by Counties	152
98. Map of Texas showing the Distribution of the German Population by Counties	153
99. Alamo Plaza, San Antonio	156
100. Diagrammatic Illustration of the Increase of Population in San Antonio, 1870-1900	157
101. Diagrammatic Illustration of the Numerical Strength of the Foreign Population of San Antonio	158
102. Courthouse and Main Plaza, San Antonio	159
103. Federal Building, San Antonio	159
104. City Hall and Military Plaza, San Antonio	161
105. View on West Commerce Street, San Antonio	161
106. The Missions near San Antonio	163
107. Dallas County Courthouse, Dallas	165
108. Main Street, Dallas	165
109. Dallas Public Library	166
110. The Wilson Office Building, Dallas	167
111. Railroad Map of the Dallas-Fort Worth Region	169
112. Map showing Houston as a Railroad Center	171
113. Business Block in Houston	172
114. Houston High School Building	173
115. Wharf Sheds and Steamships at Galveston	175
116. Building the Galveston Sea Wall	176
117. A Completed Section of the Galveston Sea Wall	177
118. View from the Top of the Galveston Sea Wall	177
119. Galveston, looking West from the Courthouse	178
120. Tarrant County Courthouse, Fort Worth	179
121. Texas and Pacific Passenger Station at Fort Worth	180
122. Post Office, Fort Worth	181
123. Carnegie Public Library, Fort Worth	182

FIG.	PAGE
124. City Hall, Fort Worth	182
125. General (State) Land Office, from Capitol Grounds, Austin	184
126. Federal Building, Austin	184
127. Seton Infirmary, Austin	185
128. View of a Part of El Paso, showing Mount Franklin . .	188
129. El Paso County Courthouse, El Paso	188
130. City Hall, El Paso	189
131. An El Paso Smelter	190
132. View in the Corsicana Oil Field	197
133. County Map of Texas	

THE GEOGRAPHY OF TEXAS

CHAPTER I

THE STATE

1. **Introduction.** Geography is preëminently the science which treats of the earth and its phenomena in their relations to mankind. From this point of view an attempt will be made in the following pages to present those features which render Texas especially attractive as a dwelling place for man: its location in the South and on the Gulf of Mexico; its vast extent of territory; its rocks and great variety of soils; its relief, which, exclusive of the Trans-Pecos mountains, ranges from a few feet on the coast to four thousand feet in the Panhandle; its rivers, available for water power and irrigation; its springs and artesian wells; its climate, including rainfall and temperature, winds and sunshine — a climate varying from semitropical and humid in the southeast to arid, semiarid, and temperate in the west and northwest; its forests and other vegetation; its native animals and game; and its agricultural, stock, and mineral resources. Furthermore, attention will be directed to the sacrifices made by man in securing a just and stable government and to the magnificent results of his labor thus far attained as shown by the largest

railroad mileage of any state in the Union, the excellent public institutions maintained, and the many beautiful cities and towns already built.

The chief source of the wealth of Texas lies in its enormous acreage of arable lands, which even now produce supplies not only for home consumption but for other countries as well; and yet their present yield but faintly indicates that of the future which, by improved methods of cultivation, will be increased many fold.

2. Location. Texas may be easily located. If a map of our country be examined we shall find, first, that, with the exception of Florida, it is the most southerly state; and, second, that although a "Gulf state," its position is midway between the Atlantic and the Pacific oceans. If it be located on the earth's surface by means of latitude and longitude, we shall find it to lie between the parallels of 26° and $36^{\circ} 30'$ north and the meridians of $93^{\circ} 30'$ and $106^{\circ} 30'$ west from Greenwich.¹

3. Boundaries. A state or country is usually bounded by naming the adjoining states or countries. Thus Texas is bounded on the north by Arkansas, Indian Territory, Oklahoma, and New Mexico; on the east by Louisiana and Arkansas, and, in the Panhandle region, by Oklahoma; on the south by the Republic of Mexico and the Gulf of Mexico; and on the west by New Mexico and the Republic of Mexico.

The geographer may employ another method. He may bound a state without mention of the neighboring political divisions. With the map of Texas before us let us trace the boundary of the state. We may begin at the outlet of

¹ Gannett, "A Gazetteer of Texas." *Bulletin of the United States Geological Survey*, No. 224, p. 9. Washington, 1904.

Sabine lake in the southeast. Passing northward through that body of water, we ascend the Sabine river to a point where it crosses the 32d parallel. Here our course becomes due north until we reach the Red river. Ascending that stream until the 100th meridian is reached, we again turn due north and so continue to the point of meeting of the parallel of $36^{\circ} 30'$, where we turn to the west. Following, now, that line until the 103d meridian is reached, we turn our faces southward and continue in that direction to the 32d parallel. Here we again change our course, following that parallel to the Rio Grande. Lastly, descending that river, we follow the Gulf coast to the starting point.

The Gulf of Mexico, Sabine lake and river, Red river, and the Rio Grande are *natural boundaries*; the *lines* followed, running in this instance north and south and east and west, are the *surveyed boundaries*.

4. Area. A glance at the map of the United States will show that Texas is the largest state in the Union. For this reason it contends with New York for the title of "Empire State." Its area is 265,780 square miles. As about 3490 square miles are covered with water, the land surface may be estimated at 262,290 square miles.

If we compare the area of the state with that of the United States, exclusive of Alaska and the Philippines, we shall find that it forms between the eleventh and twelfth part. If we compare it with the southern states east of the Mississippi, we shall find that it exceeds the combined areas of North Carolina, South Carolina, Georgia, Alabama, and Florida by over 12,500 square miles, or two sevenths of Tennessee. Compared with France and Germany, it exceeds the former by 61,633 square miles and the latter by 57,037 square miles.

The distance across the state in two directions, namely, from the point of intersection of the 32d parallel and the Rio Grande to that of the 31st parallel and the Sabine river, and from the mid point of the northern boundary of the Panhandle to the mouth of the Rio Grande, is about the same. It may be roughly stated at 770 miles.

5. Political Divisions. Texas is divided in 244 counties, of which 230 are "organized," that is, have county officers for administering the laws and for conducting their business affairs, and 14 are "unorganized," chiefly on account of the scarcity of inhabitants. The latter are in the region of the Llano Estacado, on or near the Texas-New Mexico boundary, west of the 101st meridian and north of the Rio Pecos. Dallas County has the largest population, 82,726, and Bailey the least, 4.¹ In area the counties vary greatly, from Rockwall with 171 square miles to El Paso with 9353 square miles. In their physical features, products, and, in not a few instances, inhabitants, there is also a wide divergence; but as these variations are usually characteristic of larger sections of the state than counties, they are susceptible of broader treatment. As a matter of fact, the county must be considered as a convenience on the part of the state, its officers as agents in the enforcement of local government.

6. Cities and Towns. There are in Texas twelve principal cities, the populations of which range between ten and fifty-five thousand. Of these San Antonio is first, followed in regular order by Dallas, Houston, Galveston, Fort Worth, Austin, Waco, El Paso, Laredo, Denison, Sherman, and Beaumont. There are also fifteen cities having populations between five and ten thousand, namely:

¹ *Report of the Twelfth Census, 1900.*

Paris (9358), Corsicana, Palestine, Tyler, Gainesville, Marshall, Cleburne, Temple, Greenville, Terrell, Brownsville, Brenham, Hillsboro, Texarkana, and Bonham. Of the smaller cities and towns in the state there are twenty-nine having populations between twenty-five hundred and five thousand, and sixty-six having populations between one thousand and twenty-five hundred.

CHAPTER II

GEOLOGY

7. The Relation of Geology to Physical Geography. There is a close relation between the underlying rocks of a country and its surface features, such as relief, soil, water supply, mineral resources, climate, and life. If we are to understand the physical geography of Texas, we must know something of its rocks, their composition and distribution, their position, whether horizontal or inclined, their susceptibility or resistance to the eroding or carving effects of atmospheric and aqueous agents, their disintegration and decay, — in brief, we must study its geology.

8. Kinds of Rocks. Rocks may be classed in various ways. For our purpose they may be grouped into three divisions :

1. Sedimentary or Stratified Rocks.
2. Igneous Rocks.
3. Altered or Metamorphic Rocks.

9. Sedimentary Rocks are those which have been formed in water — we usually say deposited in water. They are made up of layers, or *strata* (singular *stratum*), and for that reason are called *stratified rocks*.

Some sedimentary rocks have been formed by the wasting away and decay of older rocks. Such, for example, are *shale*, which is hardened mud or silt, and *sandstone*, which is composed of grains of a hard mineral called *quartz*. Others have been formed from the shells and

skeletons of sea and fresh-water animals, such as oysters, clams, and other mollusks, corals, and the like. By the dashing of the waves along the shore they have been broken into fragments, or even ground to a pulp. From such material *limestones* have been formed.

Again, far out upon the surface of the sea there are found myriads of lowly animals called *foraminifers*, living in minute shells. They die and their shells fall to the bottom, where, mingled with other deep-sea deposits, they form *ooze*. This is the first stage in the formation of a rock called *chalk*, which is another kind of limestone.

It sometimes happens that water in which mineral matter is dissolved evaporates. When this takes place the mineral matter will be deposited in beds or strata. Beds of *rock salt* and *gypsum* have been formed in this way.

Of the rocks found in Texas, sedimentary rocks are by far the most abundant.

10. Igneous Rocks are those which have been formed by the cooling of melted mineral matter. Such rocks are common about volcanoes. They are also found at times filling cracks and fissures in the earth's crust. If they have been formed in masses far below the surface, they are now seen only where the overlying beds have been worn away.

As examples of igneous rocks mention may be made of *granite* (so named from its crystalline or grainlike structure); *basalt*, a dark volcanic rock which is cut by joints into

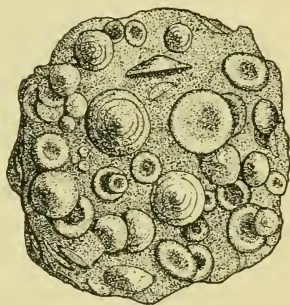


FIG. 1. A FRAGMENT OF LIMESTONE FROM ONE OF THE CRETACEOUS BEDS OF TEXAS

Showing the shells of a large Foraminifer named *Patellina texana*

many-sided columns; *pumice*, a hardened rock froth; and *lava* of various kinds.

In Trans-Pecos Texas there are lava outpourings; on the Coastal plain a few widely separated outbreaks of basalt; and in Burnet and Llano counties outcrops of granite.

11. Altered or Metamorphic Rocks are either sedimentary or igneous rocks which have been changed by the action of heat. They have been baked in the presence of moisture and sometimes under great pressure. The effect of this varies with different rocks. Some are only hardened; others are changed in a chemical way, new minerals being formed by the rearrangement of the matter of which they are composed; and others still are altered in color and in general appearance. These are some of the results of *metamorphism* (change).

As an example of this change may be mentioned the hardening of some sandstones into a rock called *quartzite*, or the alteration of ordinary limestone into *marble*.

Some altered rocks break easily in the direction of their bedding, — the minerals of which they are composed are arranged in bands or layers. Such rocks are termed *schists*. Others break into thin plates across their bedding. They are *slates*.

12. The Rocks of Texas. With the exception of a small area known as the "Burnet country," or "Central Mineral region," all of Texas east of the Staked plains, as well as the region of the Edwards and Stockton plateaus, is underlain by rocks of *marine* origin, that is, by *sea* deposits. The Staked plains, however, are capped by *nonmarine* deposits.

In the Trans-Pecos region of mountains and basins there are found not only marine and nonmarine deposits but also igneous and altered rocks.

13. The Geological Map. The various rock *systems*, arranged in the order of their age, the youngest or latest



FIG. 2

formed at the top and the oldest at the bottom, are as follows:

- | | | |
|------------------|---------------------------|---------------------------|
| 1. Recent (top). | 5. Jura-Trias. | 9. Silurian. ¹ |
| 2. Neocene. | 6. Permian. | 10. Ordovician. |
| 3. Eocene. | 7. Carboniferous. | 11. Cambrian. |
| 4. Cretaceous. | 8. Devonian. ¹ | 12. Archæan (bottom). |

Their distribution in Texas is shown on the accompanying geological map. It will be seen that they outcrop, for

¹ At present not known in the state.

the most part, in a series of more or less parallel belts or strips running in a northeast and southwest direction. Moreover, until the Staked plains are reached, each belt, beginning with that bordering the Gulf of Mexico, is of a greater age than the preceding. The rocks of the Burnet

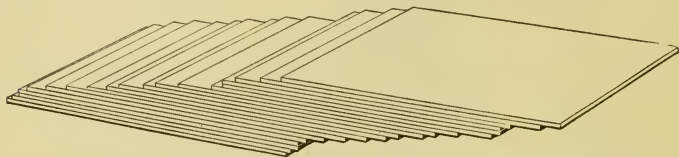


FIG. 3. DIAGRAM ILLUSTRATING THE ARRANGEMENT OF STRATA
IN THE GULF SLOPE

After R. T. Hill

The layers incline or dip from the northwest to the southeast, that is, towards the Gulf. The upper surface on the left represents the outcroppings of successively older strata as the distance from the Gulf coast increases. The side view represents a geologic section in which the order of superposition of the strata is shown

country before mentioned form an exception to this statement.

14. Recent and Neocene Systems. The latest formed marine rocks are those bordering the coast. They are made up of sand, clay, and silt, and in them are found the remains of animals, chiefly shells, now living in the Gulf. This first belt, which underlies the Coastal plain, is of the Recent and Neocene systems. On account of their great similarity, they have not been separately indicated on the map.

It is well to remember in this connection that, geologically speaking, a rock need not be hard, but that any matter forming a part of the earth's crust is a rock, be it a mass of granite or a bed of sand or clay.

The Staked plains formations have also been classed as Recent and Neocene, but, unlike the preceding, they

are of nonmarine origin. The Recent deposits which are here found on the surface consist of silt, sand, gravel, and sometimes boulders. Beneath them are encountered the rocks of the Neocene system in the form of sands, clays of various colors, sandstones, and limestones.

Along the southwest border of the Staked plains the Neocene beds rest upon those of the Cretaceous, but north



FIG. 4. WHITE DRIFTING SANDS, SIX MILES NORTH OF MONAHAN'S, WARD COUNTY

of the Double Mountain fork of the Brazos river they rest upon the Jura-Trias. Some of the strata afford fossils representing parts of the skeletons of such animals as the elephant, horse, and camel.

15. Eocene System. The outcropping beds of Eocene rocks form the second belt across the state. They are composed of sands, sandstones, clays of different colors from white to black, thin-bedded limestones, etc. Beds of *lignite*, an inferior kind of coal, are often found.

The lignite beds are usually lens-shaped — thick in the middle and thinning out towards the margin — and of limited extent, thus differing from true coal seams which usually form continuous layers over large areas. In some instances the lignite beds have a thickness of twelve or more feet.

Petrified wood and *gypsum* are also found in the Eocene formation, and in East Texas beds of workable iron ore. The presence of oil and natural gas should also be noted.

16. Cretaceous System. Further inland the outcropping Cretaceous rocks form a rather broad band stretching from



FIG. 5. RAM'S-HORN OYSTER (*Exogyra arietina*)

This fossil, characteristic of the Delrio formation of the Texas Cretaceous, occurs in great abundance at several points on Shoal creek, Austin

the Red river to the Rio Grande. Viewed as a whole they are limestones, but there are also beds of sand, clay, and shale. Some of the chalky beds con-

tain the remains of *foraminifers*. Other limestones are composed of *mollusk* shells, either whole or in a fragmental state. In short, we find in the rocks of this system both deep-sea and shore deposits.

The Black and Grand prairies, as well as the Edwards plateau, are underlain by Cretaceous limestones. Cretaceous sands are the reservoirs of a large artesian water supply; and an upper member of the system, the Taylor formation, is the source of oil at Corsicana.

17. Jura-Trias System. Skirting the eastern scarp of the Staked plains there is a narrow band of nearly horizontal strata composed of sandstone and a coarse pebbly rock

called *conglomerate*, together with clay. Its proper position is between the rocks of the Permian system and those of the Cretaceous. Generally speaking, however, it appears between the Permian rocks and the Staked plains formations already described, the Cretaceous rocks being absent.

18. Permian System. Rocks belonging to the Permian and Carboniferous systems appear, for the greater part, in a basin lying between the Staked plains and the Grand prairie (consult the relief map). The line of contact between them is not yet well established. Beds that have hitherto been called Permian occupy the western and larger part of the basin. Here are found clay, sand, limestone and gypsum deposits. On account of their widespread red color they are usually spoken of as the "Red beds." The occurrence of Permian rocks in the Guadalupe mountains and in their southeastern extension, the Delaware mountains, El Paso county, has been recently reported.

19. Carboniferous System. These rocks form the "buried floor" upon which the Cretaceous rocks were deposited. They consist of limestones, shales, and sandstones, together with seams of coal, several of which are valuable. Beds of clay are also found. The term "Coal measures" is often applied to these rocks. Carboniferous deposits are also known in the Hueco and Diablo mountains and at other points in the Trans-Pecos country.

20. Ordovician and Cambrian Systems. The oldest stratified rocks found in Texas occur in two rather limited areas — one near El Paso, and the other near the center of the state surrounding exposures of granites and schists. In the last mentioned region the Ordovician rocks are in the

form of thick, heavy-bedded limestones, while those of the Cambrian are chiefly sandstones alternating with limestones.

21. Archæan System. Beneath the rocks of the Cambrian system there is a series of beds which have been named the "Llano group." It consists of schists and other altered rocks which, with the underlying and intruded granites, represent the Archæan system.

Granite is a rock made up of quartz, feldspar, and mica. The feldspar is often of a pinkish color, and it is this mineral which gives to the Capitol at Austin its peculiar tint. The quartz is sometimes glassy and transparent, or it may be of a milky-white color. In the Capitol granite the mica is of the black or biotite variety and may be easily recognized by its thin scaly layers. When visiting the Capitol, its large, highly polished corner stone should be examined.

CHAPTER III

RELIEF AND SOILS

22. Classification. The inequalities of the earth's surface, such as its slope, undulations, hills, mountains, plateaus, and valleys, constitute its *relief*. From this point of view Texas may be divided into the following regions :

1. Gulf Slope.
2. Central Basin.
3. Plateaus.
4. Mountains and Basins.

23. Region of the Gulf Slope. This region, which includes that part of the state lying to the south and east of the Central basin and the Edwards plateau, may be separated into the following divisions :

- a.* The Coastal Plain.
- b.* The Forested Area.
- c.* The Rio Grande Plain.
- d.* The Black and Grand Prairies.

24. The Coastal Plain skirts the Gulf. It is a low, flat, and, generally, treeless region. For this reason it is often called the Coast prairie. On its outer margin it rises twenty to thirty feet above the sea, gradually increasing in elevation towards the interior. Its width on the Sabine river is about thirty miles, but it widens to the westward, reaching a hundred miles or more on the Brazos and Colorado rivers. Beyond the latter river it merges with the

Rio Grande plain from which it is separated by an indefinite and somewhat arbitrary boundary, the chief distinction being of a geologic character. That which is here designated as Coastal plain is underlain by the latest formations



FIG. 6. A RELIEF MAP OF TEXAS ON WHICH THE CHIEF TOPOGRAPHIC DIVISIONS ARE INDICATED

From a Relief Map of the United States modeled by Edwin E. Howell.
Copyright, 1892. Used by permission

— the Recent and Neocene — while the Rio Grande plain, which extends from the coast to the base of the Cretaceous highlands, is underlain not only by these but by earlier

formations (see Fig. 2). Though crossed by many streams, the drainage of the Coast prairie is poor. The water ways are but a few feet below the general level, and between them there are many swampy intervals. It is an excellent example of a recently formed plain.

Deltas. The effects of recent stream building are apparent at several points along the coast, giving rise to "delta shore lines."

The waste of the Rio Grande has produced a marked outward encroachment upon the waters of the Gulf, and the combined action of the Colorado and Brazos rivers has given rise to a similar though not so conspicuous result. The Trinity river, which empties into Galveston bay, has formed a true delta with *distributaries*. So great is



FIG. 7. DELTA SHORE LINES OF THE TEXAS COAST

the accumulation here that the delta deposits now extend nearly across the head of the bay, cutting off a body of water called Turtle bay, as shown in Fig. 8.

Peninsulas and Islands. The conflict between the sea and the land has given rise to the long narrow peninsular and island barriers fringing the Gulf coast of the state, so admirably exemplified in Matagorda peninsula and Padre island.

The waste brought down by the larger rivers is now, as in the past, extending the Coastal plain seaward. On the other hand, the prevailing winds and waves, assisted by currents and, it may be, by tides, are resenting the invasion, forcing back the sand and silt, and molding them into their present forms. Between these barriers and the older land are included bodies of shallow water known as *lagoons*

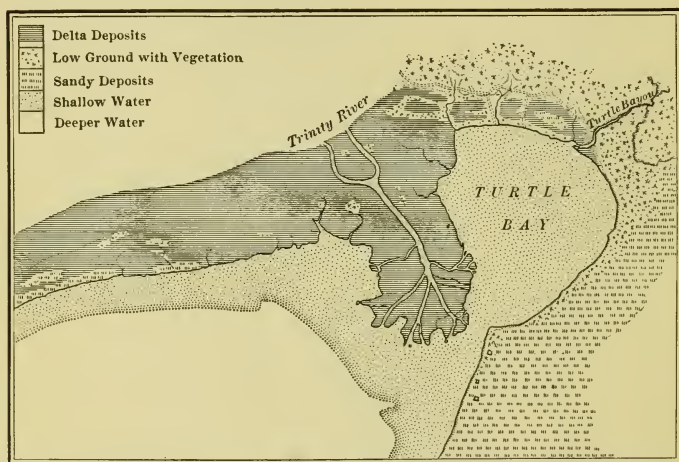
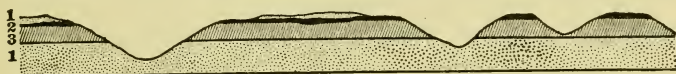


FIG. 8. DELTA AND DISTRIBUTARIES OF TRINITY RIVER

and *bays*. Furthermore, so great is the amount of waste brought down by the streams that the agents above mentioned fail to distribute the entire burden, in consequence of which the mouths of the rivers are obstructed by bars. As long as river water is in motion it will carry large quantities of mineral matter *mechanically* suspended, but when the motion ceases, such matter will fall or settle to the bottom. On this principle bars are formed, and the

point of their formation on the Texas coast is where the velocity of the river currents is checked by the waters of the Gulf.

25. The Forested Area. In eastern Texas the Coast prairie is followed on its inner margin by a rolling country and the appearance of a forest growth, hence the name "Forested area." Further inland the relief produced by the wearing of the streams becomes more marked. The formation of broad, deep valleys has left numerous hills, flat-topped and capped with beds of sandstone or iron



1, sands and clays; 2, beds of iron ore; 3, greensand beds

FIG. 9. IDEAL SECTION IN EASTERN PART OF THE FORESTED AREA,
SHOWING THE FLAT-TOPPED HILLS

After Penrose

ore, some of which make small plateaus. They represent the surface of a former plain.

The greatest elevation of this area may reach seven hundred feet, but its average height above the sea is much less, probably three to four hundred feet.

While this division is, for the most part, underlain by rocks of the Eocene system, its boundaries do not quite conform to those of the rocks, especially on the south.

Beyond the Colorado river the forest growth becomes scant, giving place to that suited to a semiarid region. Here, too, the Eocene and Coastal formations present relief features so similar that they need not be considered apart.

26. The Rio Grande Plain. That part of the Rio Grande plain which lies within the state embraces the area between the Gulf and the Balcones scarp. It blends with the

Coastal plain on the east, and on the northeast with the Coastal plain, the Forested area, and the Black prairie. It is underlain by rocks of the Recent, Neocene, and Eocene systems, and on its inner margin by those of the Cretaceous; yet there are no sharp contrasts in relief until the Balcones scarp is reached: here the change is sudden, — a plain below, a plateau above.

27. The Black and Grand Prairies. This division occupies that part of the Gulf slope lying between the Forested area and the Central basin northeast of the Colorado river. It is underlain by successive outcrops of Cretaceous strata. While the boundary between the Black and Grand prairies is geological, resulting from the outcrop of certain beds, it is marked for a considerable distance by the Eastern Cross timbers. A somewhat similar growth, the Western Cross timbers, skirts the western margin of the Grand prairie.

The Black Prairie presents a gently undulating surface and is unrivaled for the fertility of its deep, black soil. Austin, Waco, and Dallas are within its area. A low, infacing scarp follows the general direction of the Eastern Cross timbers. Although termed a prairie, it must not be understood that this region is entirely without trees, as its streams are often fringed with a growth of timber and over its surface there are found occasional clumps of live oaks. Its altitude varies from four hundred feet or less on its eastern border to six or seven hundred on its western.

The Grand Prairie resembles the Black prairie. It is, however, underlain by harder limestone. From its elevation and general character it is plateau-like. In its northern and eastern portions it is comparatively level, excepting where cut or *dissected* by the streams. To the south and southwest the encroaching valleys and rapid wearing away

of the rocks have left numerous flat-topped hills and divides. Its western border is also marked by an infacing scarp through which the older streams of the Central basin have cut their way. This scalloped margin represents the retreating edge of the rocks that once extended far over the Central basin. The Grand prairie attains a maximum altitude of about a thousand feet.

28. Region of the Central Basin. This basin lies between the region of the Gulf slope on the east and that of the



FIG. 10. VIEW ON THE PLAINS BETWEEN CHILDRESS AND MATADOR

plateaus on the west. It is separated into two parts by a hilly watershed between the Brazos and Colorado rivers, known as the "Callahan divide."¹ Here stream wear and rock decay have not yet completely severed the connection between the prairie region and that of the plateaus,

¹ See "Physical Geography of the Texas Region," by Robert T. Hill (Folio 3, *Topographic Atlas of the United States*), p. 7. Washington, 1900.

as is shown by the flat, limestone-capped hills. Widely separated but similar hills are found both to the north and to the south.

Within the Central basin there is a varying relief depending upon the hardness or softness of the underlying rocks. In the area of the Carboniferous, for example, where shales prevail, there are stretches of level prairie; where sandstones and other hard rocks occur, hills and valleys.



FIG. 11. CHILDRESS. "A CITY OF THE PLAINS"

In the Permian or Red beds area, on account of the softness of the rocks, the relief is not prominent, the general effect being that of a series of rolling plains.

The southern part of the basin includes the granite area of Burnet and Llano counties, with its fringe of Cambrian and Ordovician rocks. The relief here developed is so strong as to be spoken of as "mountainous."

29. Region of the Plateaus. The region of the plateaus is well marked. It is separated from the Central basin by an eastward-facing escarpment, and from the Rio Grande plain by a dislocation of the underlying rocks known as

the Balcones scarp. It is limited on the south by the Rio Grande and on the southwest by the Trans-Pecos mountains, while its western boundary is the valley of the Rio Pecos in New Mexico.

This region consists of the following divisions:

- a.* The Stockton Plateau.
- b.* The Edwards Plateau.
- c.* The Staked Plains, or the Llano Estacado.

The **Stockton Plateau** is the smallest of the three divisions, embracing the area between the Rio Pecos and the

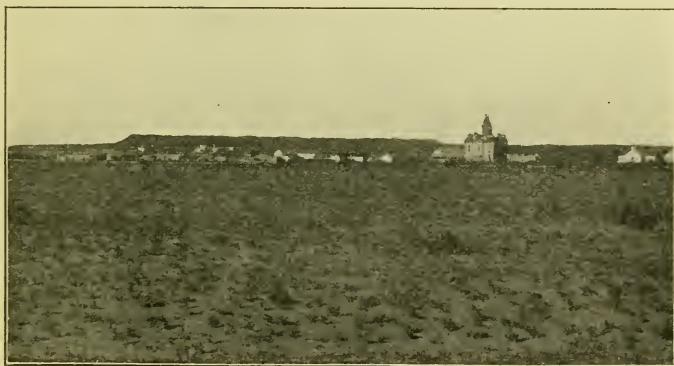


FIG. 12. SCENE ON STOCKTON PLATEAU

Fort Stockton in the distance; a mesa in the background

Trans-Pecos mountains, an area cut off from the Edwards plateau by the Pecos valley. Its general appearance is well shown in Fig. 12.

The **Edwards Plateau** is a continuation of the Grand prairie, from which it has been separated by the valleys cut by the Colorado river and its tributaries. Like the Grand prairie it is underlain by Cretaceous rocks. Along

its eastern and southern margins it has been much dissected and, as a result, is fringed with flat-topped hills. (Such hills are seen along the Colorado river west of Austin.) The summit is in the form of a level plain. From an altitude of about a thousand feet along its eastern and southern scarps the plateau rises towards the northwest, where it blends imperceptibly with the Staked plains.



FIG. 13. SCARP OF THE STAKED PLAINS, BLANCO CANYON,
CROSBY COUNTY

The Staked Plains, or the Llano Estacado, are underlain by softer rocks. They are very level, — “so level as to produce the peculiar appearance of being uphill in every direction,” — yet they really dip quite gently to the southeast. Along their eastern margin or scarp they are deeply cut by steep-walled valleys, or canyons, which have been formed by the wearing action of the head waters of the Red, Brazos, and Colorado rivers. In the northwestern

part of the Panhandle this region attains a height of over four thousand feet.

30. Region of Mountains and Basins. Between the Rio Grande on the one side and the Rio Pecos and the Stockton plateau on the other there are two or more lines of mountain elevation. The first includes the Guadalupe



FIG. 14. NORTHEAST POINT OF CHISOS MOUNTAINS, IGNEOUS ROCK, BREWSTER COUNTY

(*gwä-dä-lōō'pă*), Davis, Ord, Santiago (*sän-tē-ä'gō*), Corazones (*cor-ä-sō'nēs*), Rosillos (*rō-sil'yōs*), and Chisos (*chē'sōs*) mountains.

The highest point in the state is Guadalupe peak, 9500 feet,¹ in the range of that name just south of the

¹ These altitudes, excepting that of Santiago peak, are from "A Map of Texas and Parts of Adjoining Territories," compiled by Robert T. Hill, and published by the United States Geological Survey, 1899.



FIG. 15. EAST END OF ELEPHANT HEAD, IGNEOUS ROCK, TERLINGUA QUICKSILVER DISTRICT, BREWSTER COUNTY

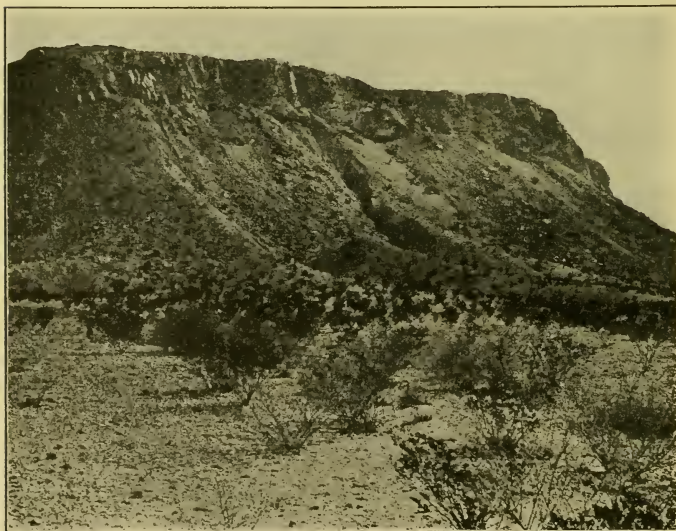


FIG. 16. STUDY BUTTE, SEDIMENTARY DEPOSITS CAPPED WITH IGNEOUS ROCK, TERLINGUA QUICKSILVER DISTRICT, BREWSTER COUNTY

Texas-New Mexico boundary. It presents to the south and west an almost perpendicular face several thousand feet high. Mount Livermore, in the Davis mountains, has a height of 8382 feet; Santiago peak, south of Alpine,



FIG. 17. BLACK MESA

A dome of Lower Cretaceous limestone due to the intrusion of igneous rock, as seen from Mariposa Store, Terlingua, Brewster county

6800 feet; and Mount Emory, in the Chisos mountains, 9000 feet.

The Guadalupe mountains are made up largely of Permian rocks. The Sierra Diablo is an old dissected highland capped with Carboniferous rocks. The Davis, known also as the Limpia, the Corazones, and the Chisos mountains are volcanic. There are also flat-topped mountains, or *mesas*, capped with volcanic rock, the remains of an old igneous outpouring.

The second line of elevations enters the state with the Hueco (*wě'r'cō*) mountains, and is continued by the Finlay, Quitman, Eagle, and Vieja (*vē-ā'hä*) mountains.

In these mountains there are found granite and other igneous rocks, as well as Carboniferous and Cretaceous limestones. The Chinati mountains are volcanic.

Between the mountains of Trans-Pecos Texas there are numerous basins or flats. These plains, though elevated,

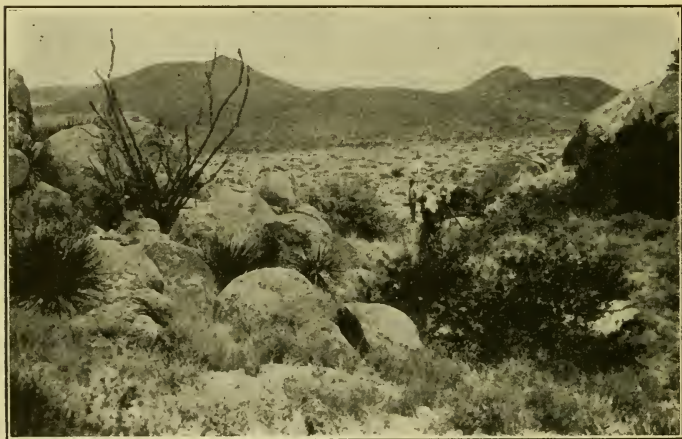


FIG. 18. VIEW TOWARDS THE FOOTHILLS OF QUITMAN MOUNTAINS

differ from ordinary plateaus. They are not capped with hard layers, but are usually covered with the waste brought down from the adjoining slopes.

This is a region of sudden contrasts. From the sandy plains mountains quickly rise, sometimes alone, sometimes in groups; here sharp summits are outlined against the sky, there great rounded domes; again flat-topped mesas appear, with steep scarps and deeply cut ravines.

Salt basin lies for the most part between the Delaware mountains, a southeastern extension of the Guadalupe mountains, and the Sierra Diablo. Its interior drainage is collected in a series of salt lakes. The Rio Grande is said to flow through a chain of old basins, connected by canyons, until it reaches the apex of the Great Bend in Brewster county.

31. Soils. The thin, unconsolidated outer covering of the earth which supports vegetation is known as soil. According to its origin it is of two kinds:

a. That formed from the decay of the underlying rocks, called *residual soil*.

b. That formed of materials carried to their present position by water, ice, or wind, called *transported soil*.

32. Residual Soils. The residual soils of Texas vary with the geologic formations from which they have been derived. On the Coastal plain they are sandy or clayey, that is composed of the waste of the older rocks of the state which, having been deposited in the Gulf, was later added to the land. Some of the clays form a black waxy soil. These recently formed soils are in many localities well adapted to market gardening, rice growing, or fruit culture.

The soils of the Forested area have also been derived from sands and clays. In the pine region they are not very fertile. Some of the clays form black waxy soils, as in the prairies of Washington and Grimes counties. The red soils of the East Texas uplands are rich and well suited for fruit growing.

The soil of the Black prairie is of the black waxy variety. It is derived from the underlying Upper Cretaceous rocks and is exceedingly rich. The soil of the Grand prairie is likewise derived from Cretaceous rocks, but from

those belonging to the lower division. It is thinner and more rocky than the preceding, but where of sufficient depth it forms excellent farming land.

The soil of the Edwards plateau is thin and of little value for agriculture.

In the Central basin the soil varies with the character of the underlying rocks. In the southern part it is derived from the decomposing granite. In the wider part of the basin, to the north, it is from the Carboniferous and Permian rocks. The soil in the Carboniferous area is in some instances black and rich; in others sandy, limy, or clayey, depending upon its origin. In the Permian area there is a limy or clayey soil of a reddish or brown color, well suited to the growth of wheat.

The residual soils of the Llano Estacado, for the most part, have been derived from the sediments of an ancient Neocene lake. They consist of brownish and reddish loams. Where irrigation has been carried on they produce well. At present, however, the lands of this region are devoted to pasturage.

33. Transported Soils. The most important variety of transported soil to be here considered is that known as *alluvial*. It fills the valleys of many rivers and streams and is made up of transported materials, the product of stream wear at numerous points. This is the soil of the "bottoms," and in some cases, where streams have carved their valleys deeper, there are two bottoms. The alluvial lands of the Brazos are among the most fertile in the state. Other valuable bottoms are found along the Red, Trinity, Colorado, Guadalupe, and Nueces rivers.

On the Llano Estacado the transported soils consist of drift, wash, and wind-blown deposits.

CHAPTER IV

SURFACE AND UNDERGROUND WATERS

34. Kinds of Drainage. The drainage of a country is represented by its rivers and their tributaries. If we examine the relief map of Texas, we shall find that the principal water courses follow the general slope of the land, that is, that the main streams flow in a southeast direction to the Gulf. Taking the rivers as a whole, it may be shown that they represent at least five kinds of drainage.

1. *The drainage of the recently formed Coastal plain*, which is just being established. Here the stream channels are but a few feet below the general level, while between them there are divides as yet undrained.

2. *The drainage of the older portions of the Coastal slope*, where the streams are of greater age and cover a larger area. They may be either independent or tributaries. This drainage is represented by the Sulphur fork of Red river, the Sabine, Neches, and Angelina rivers, the Navasota, Little river, and other branches of the Brazos, and by many tributaries of Trinity river. The larger part of the drainage of the Guadalupe and Nueces rivers should be included in this division.

3. *The drainage of the Central basin*, which is represented by upper portions of the Red, Trinity, Brazos, and Colorado rivers. They are the oldest streams in the state and have extended their channels through the successive additions as the land grew gulfward.

4. *The drainage of the plateaus*, of which the head waters of the Guadalupe, Nueces, and other streams are examples.

5. *The drainage of the Rocky mountains*, represented by the Canadian, a member of the Arkansas river system, the Rio Grande, and its tributary, the Rio Pecos.

The Rio Grande "is subject to wide variations in volume at different times of the year. From southern New Mexico to the mouth of the Pecos it is often dry late in summer, while in the springtime it is a powerful torrent."

35. The Gradient of Some Texas Rivers. At El Paso, 1030 miles from its mouth, the Rio Grande is 3700 feet above the sea level; at the mouth of the Pecos, 1000 feet. At Roby, in Fisher county, 710 miles above the mouth of the Brazos, Clear fork has an altitude of 1900 feet, and the Colorado, 519 miles above its mouth, an altitude of 1800 feet.

36. Navigation of Rivers. Generally speaking, the rivers of Texas are not navigable, though in some instances vessels of light draught may ascend a few miles above their mouths. This defect may in time be remedied in a great measure by "river improvements," such as dredging, the removal of obstructions, and the building of dams and locks.

37. Lakes. The lakes of Texas are small. They occur mostly on the Coastal slope and in the Plateau region. Among those of the Coastal slope are Caddo lake on the Louisiana-Texas boundary, Clear lake in Harris county, Grand lake in Montgomery county, Eagle lake in Colorado county, Austin lake in Matagorda county, and Espantosa lake on the line between Zavalla and Dimmit



FIG. 19. PUMP CANYON, RIO GRANDE AT LANGTRY

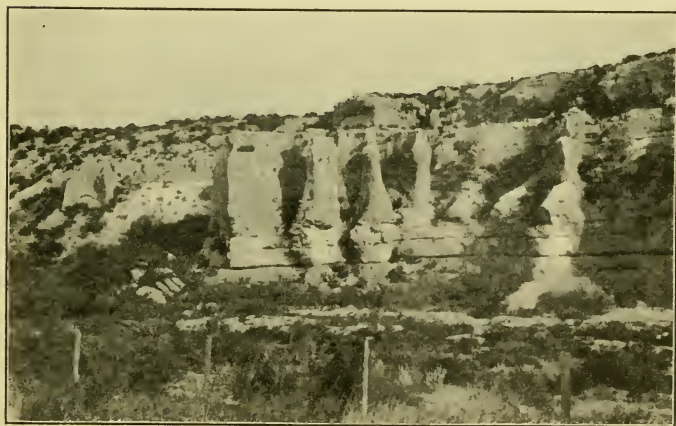


FIG. 20. CASA CANYON, NEAR DEVIL RIVER, VAL VERDE COUNTY,
ON THE GALVESTON, HARRISBURG AND SAN ANTONIO RAILWAY
(SOUTHERN PACIFIC)

counties. There is also a number of salt lakes on the Coastal plain near the mouth of the Rio Grande.

On the Staked plains there are many small bodies of water both permanent and temporary. Some are salt. In Salt basin, between the Delaware mountains and the Sierra Diablo, there are numerous salt lakes resulting from the interior drainage.

38. Water Power. West of the Colorado river there are many streams having their sources in the large springs of the Edwards plateau or those bursting forth at the base of its southern scarp, which afford excellent water power. The larger streams of the state, as the Colorado and the Brazos, are also utilized at many points, but they are subject to unusual floods and also to a great diminution of volume in dry seasons.

On the Guadalupe river, between Cuero and Ingram, there are not less than twelve plants (dams with the necessary machinery) where water furnishes the power for pumping, milling, etc., and on the San Marcos as many or more. The latter stream rises in a magnificent spring over which the water is now backed by a dam erected a quarter of a mile below. It furnishes the power by which the town of San Marcos is supplied with water and electric light.

At Marble Falls, on the Colorado, the river is checked by a natural limestone dam, affording a total fall of twenty-two feet. Below this the river descends rapidly through a deep canyon where enormous water power could be developed.

39. Irrigation. In addition to water power there are many streams which supply water for irrigation, or the artificial watering of the land. This is done by means of

dams for raising and storing the water and by systems of distributing ditches. The waters of the Pecos are used for this purpose at several points, as are also those of the North Concho, a tributary of the Colorado. San Filepe creek, near Delrio, furnishes water both for power and for irrigation, as does the San Saba at Menardville. These



FIG. 21. MARBLE FALLS ON THE COLORADO RIVER ;
A NATURAL DAM

are a few examples of what has been done to render arid and semiarid lands productive.

Irrigation by pumping has become of first importance on the Coastal plain, especially since the introduction of rice and truck growing. The pumps, often of great power, are operated by steam or gasoline. One pumping station will furnish water for many acres. The rivers, small lakes, artesian and even ordinary wells are the sources of water supply.

40. Artesian Water. Where water cannot be obtained by digging ordinary wells, it is sought for by boring or drilling. When underground waters are reached by this method, they often burst forth under pressure, sometimes even throwing a stream high in the air, at other times rising many



FIG. 22. ARTESIAN WELL ON BOSQUE FARM,
(AS IT APPEARED IN 1890) FOUR MILES
WEST OF WACO, MCLENNAN COUNTY, AND
248 FEET ABOVE THE PUBLIC SQUARE

feet in the drill hole without reaching the surface. Such waters are called *artesian*. Their source is far away and they have traveled long distances through sandy and other rock layers which must be inclined. In arid or semiarid regions, or where the surface supply is very irregular, artesian wells are of the greatest value both for drinking and for irrigating purposes.

The artesian area is almost entirely confined to the Gulf

slope. Thus far wells have shown the existence of water-bearing strata in certain formations belonging to four of the rock systems — the Neocene, the Eocene, the Cretaceous, and the Carboniferous. The waters of the last, in the Central basin, contain so much mineral matter as to be

of little value, and some of the wells near the coast furnish brackish or sulphurous waters. Of the water-bearing beds, those of the lowermost Cretaceous, known as the Trinity

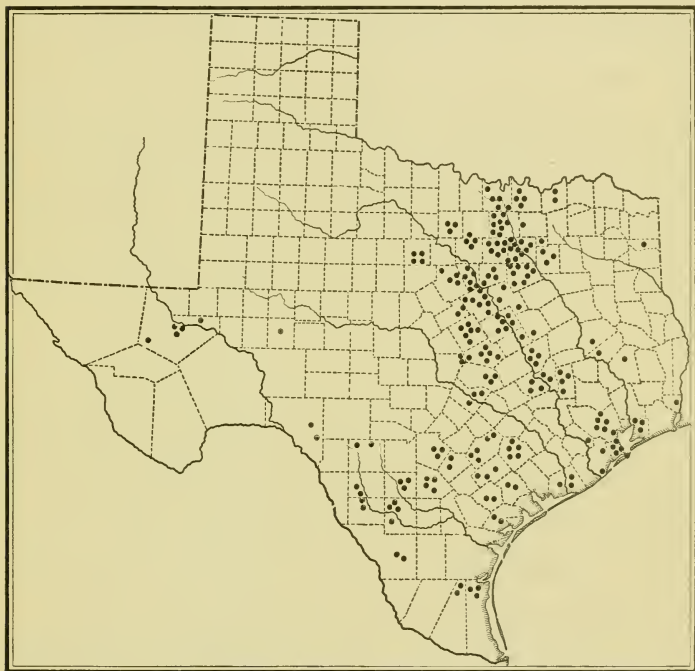


FIG. 23. MAP SHOWING THE ARTESIAN WATER AREAS OF TEXAS

The sign • in many cases represents groups of wells

sands, are the most valuable in the state, on account of the good quality of the water and its abundant flow.

Artesian water is struck at various depths, and usually more than one water-bearing stratum is encountered in the same well, especially if it be a deep one. The well at Marlin, 3330 feet, is said to be the

deepest in the state. Water was encountered at 3200 feet and at the bottom. The latter flow is warm and has a pressure of nearly a hundred pounds to the square inch. The experimental well at Galveston is 3070 feet deep. Water was encountered at nine different horizons, the strongest flow probably at 2920 feet. This well was a disappointment to the citizens, as it furnished brackish water. The average depth of the wells at Waco is estimated by R. T. Hill at 1842 feet.¹ Good flows have been obtained from two horizons. At Fort Worth four horizons have been encountered, the best flow being that obtained at the depth of a thousand to twelve hundred feet. The wells at Denton furnish good supplies of excellent water from a depth slightly over six hundred feet. A well in the southern part of Houston county only fifty feet deep is said to have gushed several feet above the surface.² The above statement will suffice to show the wide range of artesian conditions in the region of the Gulf slope.

41. Springs. In addition to common springs which issue from beneath bluffs or well up near the banks of water courses, there is found in Texas a series of remarkable *artesian springs*, often of large volume, which arise from fissures along the line of the Balcones displacement. They are usually in the form of beautiful pools of clear water. Such springs are found at Austin, Manchaca, San Marcos, San Antonio, Brackett, Delrio, and elsewhere.

There are also in the state many mineral springs and wells, some of which, having achieved more than a local reputation for their curative powers, are now well known as resorts. As belonging to this class mention may be made of Mineralwells in Palo Pinto county; Hynson's Iron Mountain Springs and Rosborough Springs, west and south of Marshall; Wootan Wells in Robertson county; and Dalby Springs in Bowie county.

¹ "Geography and Geology of the Black and Grand Prairies, Texas." *Twenty-first Annual Report of the United States Geological Survey*, Part VII, p. 539. Washington, 1901.

² *Texas Almanac and State Industrial Guide* for 1904, p. 293.

CHAPTER V

CLIMATE

On account of its large size, its nearness to the tropics, and its relief, Texas experiences a great variety of climate.

42. Rainfall. The eastern part of the state is *humid*. Here the annual rainfall averages from fifty to sixty inches. Towards the west it gradually diminishes. In the region of the Black prairie, and south of it, forty to fifty inches fall. This is followed by a belt, including a portion of the Grand prairie and a portion of the Central basin, also extending to the Gulf, in which the rainfall is thirty to forty inches annually. Beyond this the rainfall steadily diminishes. At the foot of the Llano Estacado it amounts to about twenty inches, and on the plateau it is reduced to between ten and twenty inches. At El Paso it is about ten inches.

It will be seen that while the eastern part of the state is plentifully watered, *arid* and *semiarid* conditions prevail in the west. With an annual rainfall of less than twenty inches, agriculture cannot be carried on without irrigation.

In the eastern part of the state rain falls most abundantly in the winter. Its source is the Gulf of Mexico. In the west the greatest rainfall is during the summer months, and its source is chiefly the Pacific ocean.

43. The Distribution of Rainfall by Months. "The accompanying diagram, Fig. 25, shows the quantity and

average distribution of rainfall by months at a number of selected stations fairly typical of the state as a whole. The first of these is Galveston, on the coast, in the eastern part of the state. Here the average rainfall for twenty-seven years is 49.6 inches. As shown by the diagram, the months of heaviest precipitation are September and August, but in



FIG. 24. MAP OF TEXAS SHOWING THE MEAN ANNUAL RAINFALL IN INCHES

every month, except February, an average of over three inches of rain has fallen. This is fairly typical of the distribution of rainfall along the Gulf coast. The diagram next above this is for Austin, where the average rainfall for thirty-nine years is 33.4 inches. Here also there is an excess of precipitation in September, and a second

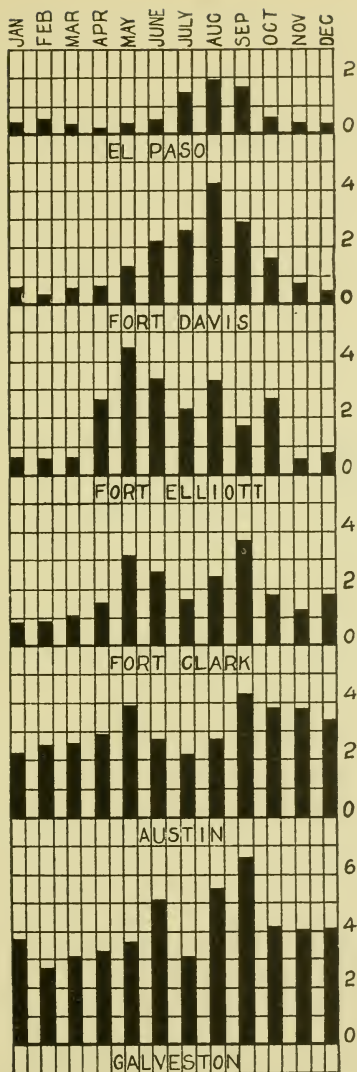


FIG. 25. DIAGRAM OF THE MEAN MONTHLY RAINFALL
AT SIX STATIONS

The numbers on the right indicate inches

maximum in May. Relatively to these months, June, July, and August are somewhat dry; but in every month throughout the year there has fallen an average of over two inches of rain.

“The next diagram in Fig. 25 above that for Austin is that for Fort Clark, or Brackettville. This is constructed from the average for twenty-nine years. The mean annual rainfall is 22.7 inches. Fort Clark is remote from the coast, and the distribution of its rainfall, though somewhat similar to that at Austin, having maxima in September and May, shows reduction in quantity, especially during the winter months. Next above the diagram for Fort Clark is that of Fort Elliott, situated far up in the Panhandle of Texas, near the Oklahoma line. Here the quantity and distribution are fairly typical of the Great plains area. The diagram is derived from the mean observations extending over eleven years and giving an annual average of 23.2 inches. The month of greatest rainfall is May, September being below the average. The rainy season may be said to extend from April to August.

“In the upper part of Fig. 25 are two diagrams illustrating the typical distribution of rain in Trans-Pecos Texas. This has been named by General Greely the Mexican type of rainfall. In these, particularly in the diagram for Fort Davis, obtained from twenty-six years' observations, the rainfall is seen to increase regularly from February to August and then to decrease rapidly to the end of the year. The greater part of the precipitation occurs during June, July, August, and September, at the time when most needed by the crops. The diagram for El Paso, from thirty-six years' averages, shows a relatively uniform but small precipitation throughout the year,

with the exception of the months of July, August, and September.”¹

44. Temperature. The temperature of Texas varies greatly. This is due in part to the vast extent of the state, but chiefly to its relief and other geographic causes.

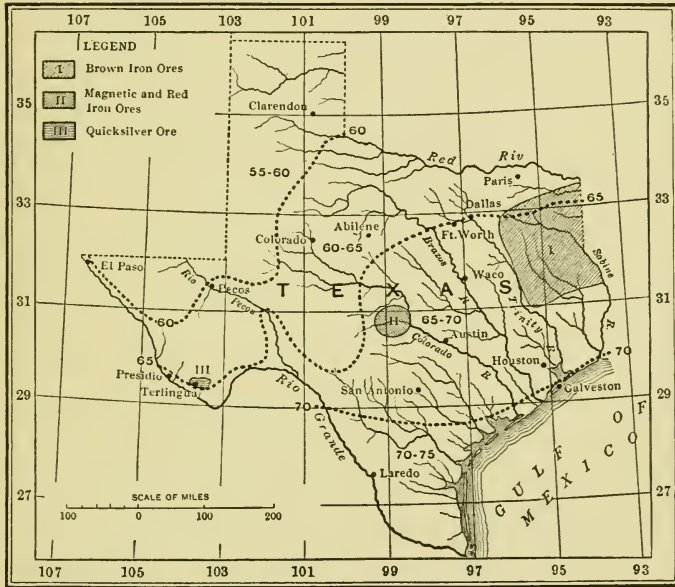


FIG. 26. MAP OF TEXAS SHOWING THE MEAN ANNUAL TEMPERATURE (after Gannett) AND THE IRON AND QUICKSILVER AREAS

Along the low Coastal plain there is a great uniformity, while in the elevated region of the Panhandle and in the Trans-Pecos country the extremes are often widely

¹ William F. Hutson, "Irrigation Systems in Texas." *Water-Supply and Irrigation Papers of the United States Geological Survey*, No. 13, pp. 22-24. Washington, 1898.

separated. Snow is of rare occurrence on the coast. Throughout the state, however, sudden changes — “drops” — in temperature are common, though of wider range and more noticeable in the winter than in the summer months.

45. Cold Waves, or “Northerers.” “The term ‘cold wave’ is a technical one, devised by the Signal Corps, to represent not the intensity of cold — save within certain limits — but rather to indicate the idea of very decided falls of temperature within such a limited time as to produce physical discomfort to mankind, cause injury to growing vegetation, or work material harm to local interests. These sudden falls of temperature usually occur in Texas in connection with a north wind of considerable violence, which progresses with regularity from the northern boundary southward until its force is spent over the Gulf of Mexico, or its strength modified by other adverse meteorological conditions. The name ‘norther’ — from the direction of the wind — is appropriately applied to these storms in Texas, Mexico, and other countries affected by them. The term ‘norther’ is, in the minds of most strangers to the state, associated with solely that of Texas, and many persons are under the erroneous impression that such storms are not only dangerous and frequent, but that they constitute a marked and special characteristic of the state as a whole. As a matter of fact, some parts of Texas are very rarely affected by northerers, say not more than twice a year, and for fully one third of the state the norther is so light that its coming is usually hailed with satisfaction as a welcome and health-giving tonic, purifying the air and stimulating personal activity.”¹

¹ *Report of the Chief Signal Officer of the Army* [A. W. Greely] on the *Climatic Conditions of the State of Texas*, p. 16. Washington, 1892.

46. Winds. The effects of a high summer temperature are greatly modified in most parts of Texas by the deflected Atlantic trade winds which blow quite steadily from the southeast. Immediately preceding a cold wave, however, the cessation of the southeast wind is followed by a short period of sultriness, which, of course, is not so well marked during the winter months. The wind, ordinarily termed "norther," which accompanies a cold wave has usually expended its energy within twenty-four to forty-eight hours, although the return of the southeast wind may occasionally be delayed for a longer period.

Northers when accompanied by rain are spoken of as "wet," and when accompanied by clear weather as "dry." In summer the approach of a norther is usually heralded by an electrical disturbance, and this is by no means rare at other seasons. Great masses of clouds — thunderheads — appear in the north, northwest, and less commonly, perhaps, in the northeast, and the display of lightning is very impressive. When a norther is accompanied by a low, dark blue or gray cloud stretching continuously across the horizon, it is termed a "blue norther," and many people are of the opinion that they can detect an odor like that of burning paper or a burning forest.

"The mean direction of the wind over Texas for the different months of the year is as follows: December, January, and February the winds in the northwestern half of the state are largely northwesterly, with interruptions of southerly winds; in the remaining parts of the state the winds are southerly or northwesterly, the first named direction being somewhat in predominance. During March southeasterly winds prevail, with the northwesterly direction next in order of frequency, especially in northern

Texas. From April to November southeasterly winds very largely predominate, except during July and November, when the tendency is a little more southerly; but during these months interruptions of northerly or northwesterly winds occasionally obtain, particularly over northern Texas.”¹

At remote intervals the coast of Texas is visited by tropical hurricanes that apparently have been deflected from their normal course, and in at least two instances they have been productive of great disaster.

The storm at Indianola in September, 1875, was exceedingly severe, the wind reaching the velocity of one hundred miles an hour. “As at Galveston, enormous quantities of sea water were driven inland, and the greatest damage and loss of life occurred during the ebbing of the flood seaward.”² The loss of life on this occasion reached one hundred and seventy-six, while the property loss was over one million dollars.

In its destructive effects the Galveston storm of September, 1900, ranks among the world’s great calamities.

“On the morning of the 7th the storm was central south of the mouth of the Mississippi river, and reports from Gulf coast stations furnished evidence of its marked strength and subsequent course. But neither these reports nor those of the morning of the 8th indicated a coördination of storm energies which would overwhelm Galveston island with waves of unprecedented magnitude from both the Gulf and the Bay.

¹ *Report of the Chief Signal Officer of the Army on the Climatic Conditions of the State of Texas*, p. 27.

² See “Hurricanes on the Coast of Texas,” by General A. W. Greely, United States Army. *National Geographic Magazine*, Vol. XI, No. 11, November, 1900, p. 443.

“The principal agent of destruction at Galveston was water from the Gulf of Mexico and Galveston bay. The wind, which doubtless exceeded a velocity of 100 miles an hour, was chiefly important as a cause of the high seas. During the afternoon of the 8th the highest tide ever experienced at Galveston began to run in from the Gulf *against* the wind. This was a storm wave impelled by the advancing hurricane. Simultaneously waves from Galveston bay, driven by a northerly gale, covered the inner side of the island.

“The geographical position and the topography of Galveston island render it, in the presence of severe storms, peculiarly subject to inundation. In common with all low-lying districts on the coasts of great bodies of water, it has occasionally been covered by high tides which have been caused either by on-shore gales of unusual severity or by waves which have run ahead of the vortex of a hurricane. On September 8th both of these causes contributed to the overflow of the island. The storm wave from the Gulf, combined with the influence of the gale which swept over thirty miles of water surface in the Bay, heaped water from both the Gulf and the Bay over the long narrow strip of sand which composes Galveston island. The floods thus produced exceeded by eight or nine feet any previous flood which has visited the city of Galveston, and the almost irresistible force of the enormous waves, together with the strength of the hurricane winds, resulted in a disaster which is without precedent in the history of the United States.”¹

¹ “The West Indian Hurricane of September 1-12, 1900,” by E. B. Garriott, Professor of Meteorology, United States Weather Bureau. *National Geographic Magazine*, Vol. XI, No. 10, October, 1900, pp. 391, 392.

47. Sunshine. The importance of sunshine as a climatic element cannot be overlooked. It is both health-giving and growth-producing. Dr. I. M. Cline, for a number of years the representative of the United States Weather Bureau at Galveston, is the authority for the following statement: "The southeastern portion of the state has 55 to 65 per cent, while the Trans-Pecos region and the Panhandle have 65 to 75 per cent of the possible sunshine. Very few days pass in Texas without some sunshine. Along the Gulf coast it is approximated that the sun shines to some extent 320 days out of a year, and the number of days with some sunshine is greater than this over other portions of the state."¹

¹ United States Department of Agriculture, Weather Bureau, Texas Weather Service, Special Bulletin No. 4, 1894, p. 10.

CHAPTER VI

VEGETATION

48. General Statement. The plants of Texas are of many kinds, ranging from the stately forests of the eastern border to the grasses and yuccas of the western plains; from the luxuriant growths of the Sabine valley to the arid vegetation of the Rio Grande.

The chief causes of these variations are to be found in the abundant, moderate, and scanty rainfalls, and in the differences in altitudes, temperatures, and soils in the different regions of the state. In the consideration of its plant life, therefore, the vast extent of Texas should not be lost to view, for within its borders we shall find the meeting points of several widely varying floras.

49. Forests. The distribution of the forest growth is shown on the accompanying map (Fig. 28). It will there be seen that by far the larger part of the state is treeless, or, to be more precise, only about a fourth part is timbered. While some of the forests are very valuable for their timber resources, others furnish little of worth except posts, for fencing, and fuel.

50. The East Texas Timber Belt. The forested region of eastern Texas is of the greatest importance. Here are found the long-leaf, the short-leaf, and the loblolly pines; the cypress, which occurs along the streams; and a great variety of hard woods, such as oak, hickory, ash, walnut, and beech.

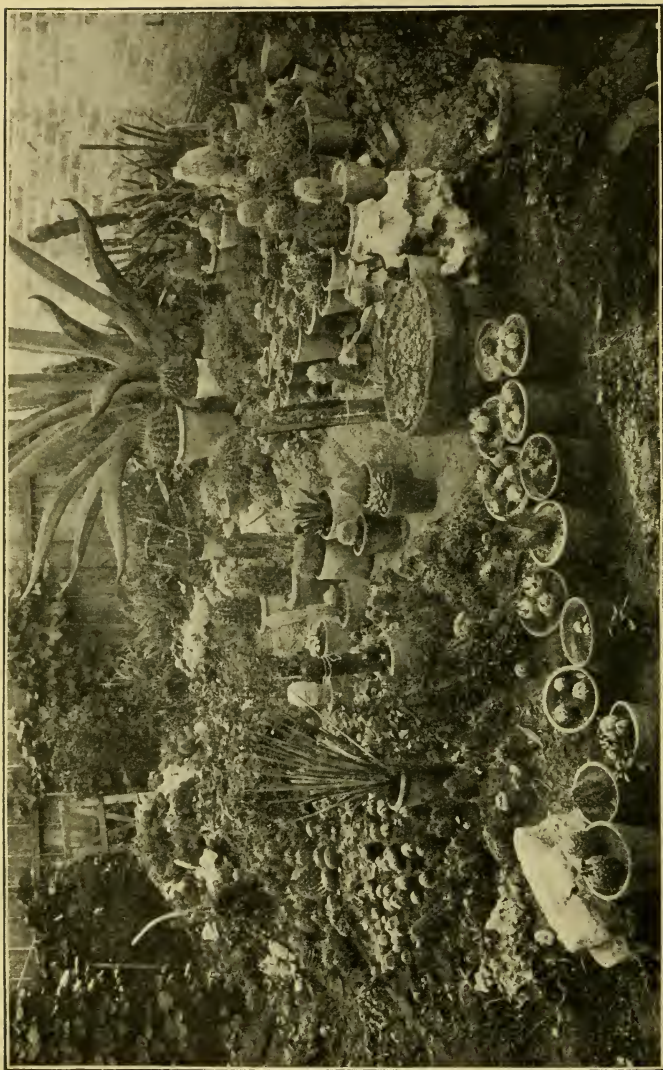


FIG. 27. EIGHTY-FIVE VARIETIES OF TEXAS CACTI
Assembled by Mr. Charles Huppertz

In 1900 these forests furnished one billion feet of lumber. Of the trees of this area the long-leaf pine is considered the most valuable, though when sawed into lumber the three pines can scarcely be distinguished by an expert.

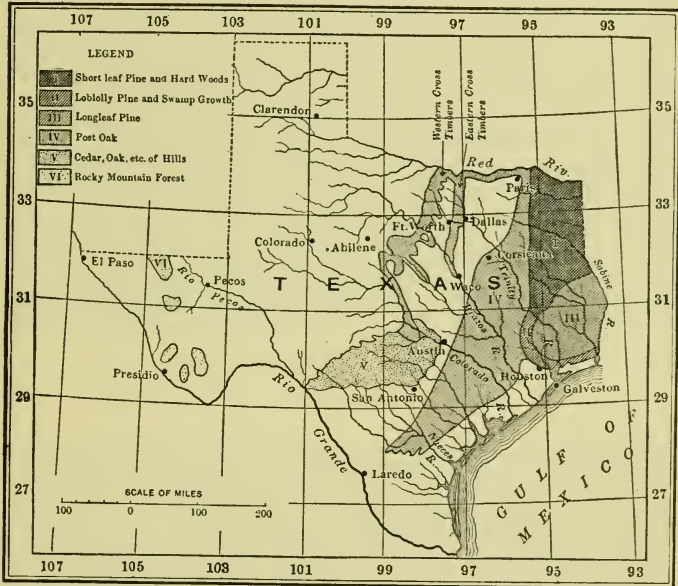


FIG. 28. MAP OF TEXAS SHOWING THE WOODED AREAS

After Bray and Gannett

“The forests of long-leaf pine extend from the Sabine west to the Trinity river and from the grassy savannas of the coast region north to the center of Sabine, San Augustine, and Angelina counties, and include an area of about 2,890,000 acres. In amount and quality of the timber these forests are unsurpassed and are only equaled by the forest of the adjoining region in Louisiana. Toward

their southern borders the country, like the pine flats of southwestern Louisiana, is perfectly level and poorly drained, with the soil water-soaked for the greater part of the year. These flats have been almost completely stripped of their merchantable timber. North of Nona the surface rises gradually above the water level in broad, low swells, and, being underlaid by strata of stiff loams, is more or less deficient in drainage. The intervening wide flats are frequently covered with a dense growth of large shrubs and small-sized trees consisting of various species of hawthorn, the deciduous holly, dahoon holly, privet, plane trees, and magnolias. These impenetrable thickets are common and often cover many square miles, like the so-called Big Thicket in the lower part of Hardin county, said to be from ten to fifteen miles wide either way. The growth of long-leaf pine which covers the gentle, wide swells is dense, of fine proportions, and of remarkably rapid development.”¹

From one hundred and thirty to one hundred and sixty-five miles from the coast the long-leaf pine forests are succeeded by those of the short-leaf pine, which cover the northeastern part of the state, extending on the north beyond the Red river into Indian Territory and Arkansas, and on the east into Louisiana.

The area occupied by the loblolly or swamp pine overlaps the areas of the short-leaf and the long-leaf pine. Within the last mentioned the loblolly is found scattered along the water courses, while in the first mentioned it occurs intermingled with other pine and deciduous growths.

¹ “The Timber Pines of the Southern United States,” by Charles Mohr, Ph.D. United States Department of Agriculture, Division of Forestry, Bulletin No. 13, pp. 45, 46. Washington, 1896.



FIG. 29. SWAMP AND BAYOU SCENE. TUPELO AND CYPRESS SWAMP,
BEAUMONT



FIG. 30. PALMETTO AND OAK GROWTH ON THE EAST FORK OF SAN
JACINTO RIVER, TEN MILES EAST OF NEW CANEY, MONTGOMERY
COUNTY

The best development of the species within the state, however, is to the west and south of the long-leaf area.



FIG. 31. THE LONG-LEAF PINE FOREST OF THE LOUISIANA-TEXAS AREA

These trees furnish the most valuable lumber

forest grounds are so stripped and exposed to fire that no future stand can be counted on.¹ It would seem the

That these magnificent forests will soon be numbered with the things of the past seems probable. According to Dr. William L. Bray, the long-leaf pine of Texas is being cut at the rate of some three quarters of a billion feet of lumber each year. At this rate he thinks it a reasonable estimate that the virgin pine may hold out twenty years longer. And he further calls attention to the fact that with the prevailing systems of logging the

¹ See "Forest Resources of Texas," by William L. Bray. United States Department of Agriculture, Bureau of Forestry, Bulletin No. 47, p. 23. Washington, 1904.

part of prudence that the state should take some action concerning the restoration of its timbered areas before it is too late. That the cultivation and growth of forest trees is both practical and remunerative has already been amply demonstrated, and under the conditions prevailing in this country the demand for good timber would be unlimited.

51. The Post Oak Country and the Cross Timbers. On their western border the pines give way to a post oak and black jack growth which, following the general course of the outcrop of Eocene strata towards the southwest, gradually decreases and finally disappears not far from the Nueces river. Connected with the Post Oak country by a narrow strip extending up Red river are two narrow southern prolongations of a similar growth, known respectively as the Eastern and Western Cross timbers. The former, as previously stated, marks the boundary between the Black and Grand prairies, while the latter skirts the western margin of the Grand prairie. Associated with the dominating species are various other trees, such as several forms of oak, the hickory, persimmon, and dogwood.

52. The Forest Growth of the Edwards Plateau. The streams flowing in the canyon valleys of the Edwards plateau are often fringed with a forest growth which includes such trees as the pecan, live oak, sycamore, elm, walnut, and, strange to say, the cypress. The latter is of course far removed from its kindred in the eastern Texas swamps.

As distinct from this growth of the valleys, mention should be made of that found on the hilly, dissected border of the plateau, the cedars and dwarf, scrubby oaks. Patches

of stunted oaks, called "shinneries," are also found on the higher parts of the plateau.

53. The Trans-Pecos Forest Growth. The forests of the Trans-Pecos region are confined to the high mountain slopes and canyons. They are of the Rocky mountain



FIG. 32. CEDAR GROWTH ON HILL WEST OF SHOAL CREEK, AUSTIN

type, and in the vicinity of the Great Bend of the Rio Grande are found above six thousand feet. While much of the timber is dwarfed and gnarled, in the higher parts of the Guadalupe, Davis, and Chisos mountains there are pines, cedars, and other trees of large size.



FIG. 33. ROCKY MOUNTAIN CEDARS AND OAKS
Camp scene, summit of Chisos Mountains, Brewster County



FIG. 34. COTTONWOOD TIMBER, SAUCITO, PRESIDIO COUNTY

54. Vegetation of the Coast Prairie. Although the vegetation of the Coast prairie is largely in the form of grasses and rushes, — plants suited to low, swampy lands, — the live oak occurs here and there in scattered clumps, called “mottes,” and in some abundance along the Brazos, Colorado, and other streams. Beyond Corpus Christi the decrease in rainfall and other climatic conditions cause a change — the swamp growth is followed by the “grasses



FIG. 35. LIVE-OAK MOTTE WEST OF AUSTIN

of the plains,” together with the more or less arid vegetation of the Lower Rio Grande region.

“The timber that is found in the Coast prairie region of East Texas, along the streams and in isolated groves, is mostly cottonwood, willow, elm, hackberry, sycamore, ash, water oak, pin oak, post oak, some red oak, and cedar, and, in the western part of the area, pecan and mesquite. Dense growths of vines, rattan, poison oak, and grape vine have often wrapped themselves about the trees, forming an impassable network. The spread of the mesquite

in this region is a noteworthy fact. When the country was first settled it was a rare tree in the valley of the lower Brazos, and was identified only with the western prairies. Since that time, however, it has spread to the east, and is now seen in considerable quantities about Sealy and other Brazos River towns.”¹

55. Vegetation of the Rio Grande Plain. On the Rio Grande plain the vegetation of the Forested area gives



FIG. 36. THE STAKED PLAINS

The vegetation consists of yucca and grass

way to that better suited to the arid and semiarid conditions that prevail there. This is the “chaparral country,” so named from a bushy, thorny growth in the form of thickets of acacias, mesquite, and many other plants. The soil, too dry and sterile for cultivation without irrigation, supports a growth of grass which renders the plain

¹ “Geology of the Gulf Territory of Texas,” by R. A. F. Penrose, Jr. *First Annual Report of the Geological Survey of Texas*, p. 8. Austin, 1890.

well adapted to stock raising. As in many other parts of the state, the cacti are interesting and numerous.

56. Vegetation of the Prairie Plains and the Plateaus. The Prairie plains, which include the Black and Grand prairies and the Central basin, have long been noted for their grass (see Fig. 10). As already stated, they are not entirely treeless. In addition to live-oak mottes, their streams are often fringed with a forest growth, and they are divided by the Eastern and the Western Cross timbers. The encroachment of the mesquite upon the grass lands has been noticed in recent years.

The higher plains of the Edwards plateau and the Llano Estacado also form a "grass country." Besides grasses of several kinds there is on the Staked plains a considerable growth of Bear grass and Spanish dagger (*yucca*).

57. Life Zones. From the outline of plant distribution in the preceding sections it is clear that in Texas we have the *focal* or meeting point of a widely diversified plant growth. That this peculiar condition may be further emphasized, attention is now called to the so-called "Life Zones."

Based upon the distribution of plants and animals, and with boundaries somewhat indefinite, North America has been divided into three great transcontinental regions, or belts, namely:

1. Boreal, or Northern.
2. Austral, or Southern.
3. Tropical.

Although the Boreal region is prolonged southward along the higher ranges of the Rocky mountains, it is not represented in Texas.

Of the Austral region the following *zones* are recognized :

a. Transition, which enters the state in the region of the Guadalupe mountains and is characterized by a Rocky mountain vegetation, especially the pine forests.

b. Upper Sonoran, which includes the Panhandle country north of the Canadian river and the Llano Estacado, with a vegetation characteristic of the Great plains at the base

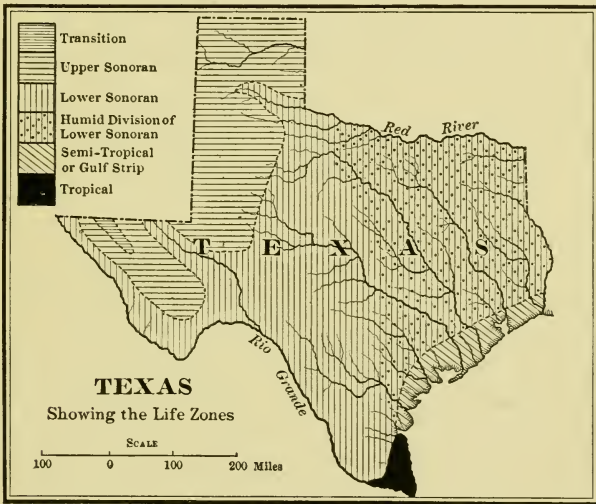


FIG. 37. MAP OF TEXAS SHOWING THE LIFE ZONES

of the Rocky mountains. It is also represented in the Trans-Pecos "by a series of isolated mountain summits rising out of the Lower Sonoran zone" (Bray).

c. Lower Sonoran, which includes the western part of the Central basin, the Edwards and Stockton plateaus, the Rio Pecos valley, and the Rio Grande valley and plain with the exception of a small area near the mouth of the river.

The plants of the Central basin have a close relationship with those of the prairies to the north, whereas the plants of the Rio Grande plain have a close relationship with those of the Tropical region to the south.

d. Austroriparian or Humid Division of the Lower Sonoran embraces eastern Texas exclusive of the Coastal plain. Here are found the Forested area or the southwestern extension of the Atlantic Timber belt, the Black and Grand prairies, the Cross Timbers, and, although transitional in character, the eastern part of the Central basin.

e. Semitropical or Gulf Strip, which, as a narrow belt beginning on the coast south of Corpus Christi, forms a border along the Gulf of Mexico passing into Louisiana. Its life and climate are transitional between the Austral and Tropical regions.

The Tropical region invades Texas along the Lower Rio Grande, extending up the coast until it passes into the Gulf strip as already outlined.

58. Characteristic Plants and Animals. While vegetation may well characterize the "life zones," there are also forms of animal life which may be equally valuable in affording distinctive characters. This is not unexpected, inasmuch as animals always frequent those regions which furnish the necessary food supplies. In this manner certain forms of plant life and certain forms of animal life are often associated. It must be noted, however, in this connection that the range of some animals, as the migratory birds and some insects for example, is so great that they are common to several zones, and therefore cannot be regarded as in any sense characteristic, and the same is true of plants, but in a lesser degree.

CHAPTER VII

FAUNA

59. The Animal Life of Texas. From our knowledge of the topography, climate, and vegetation of the state, the chief elements of control in the distribution of animal life, we may readily conceive that the fauna of this region, before the advent of the Anglo-American civilization (see Chapter XI) must have been exceedingly rich and varied. And such it was. Vast herds of buffalo roamed over the prairies, deer, bears, turkeys, quail, and other game abounded, not to mention opossums, raccoons, rabbits, wild cats, wolves, foxes, squirrels, and a host of less important forms. Now in the more thickly settled areas the larger animals have completely disappeared, and even in the wilder and less accessible parts they are fast approaching extinction. In the struggle for existence the invertebrate¹ alone seems able to cope with man. Insects, especially, prey upon the plants of his field and multiply with alarming rapidity. In one instance at least — the invasion of the cotton-producing districts of the state by the Mexican boll weevil — they have inflicted almost incalculable damage upon the most important crop grown.

It is not to be expected that the same animals will be of equal abundance in all parts of the state, for their

¹ The animal kingdom consists of two well-defined groups, — animals with backbones, called vertebrates, and animals without backbones, called invertebrates.

distribution will in a greater or less degree be influenced by the elements of control already mentioned. On the Rio Grande there is a fauna in which Mexican species occur. "The presence of the jaguar, ocelot, and other tropical cats, the armadillo, and a considerable number of tropical birds in southeastern Texas [southern or southwest Texas] is the direct result of the continuous extension of the Tamaulipan arid fauna from Mexico into Texas."¹

There are also many animals in the state common to it and the country to the north and east. Thus the prairie dog



FIG. 38. MEXICAN
BOLL WEEVIL

Adult, much magnified

ranges from "western Texas and Kansas to the base of the Rocky mountains and north to Montana"; the raccoon "from the eastern United States to the Rocky mountains"; the badger "from western North America east to Wisconsin and Texas"; while the original range of the bison or buffalo was from the Northwest Territory of the British possessions to Mexico, and from the Rocky mountains to the head waters of the Ohio.²

Again, there are animals in the north and east which are represented in the west and southwest by closely allied varieties, as the black bear, the coyote or prairie wolf, the foxes, the jack rabbits, and the Virginia deer. Some of these varieties are characteristic of Texas, and in a few instances they have been dignified with the rank of species, as, for example, the Texas opossum and the Texan or fan-tailed deer.

¹ Merriam, "Life Zones and Crop Zones of the United States." United States Department of Agriculture, Division of Biological Survey, Bulletin No. 10, p. 52, Washington, 1898.

² See "American Animals," by Stone and Cram. New York: Doubleday, Page & Co., 1902.

60. Mammals. The class of mammals includes the highest forms of vertebrates or backboned animals. Its members are characterized by the presence of mammary glands,

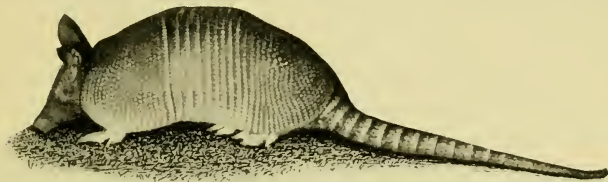


FIG. 39. NINE-BANDED ARMADILLO

which supply nourishment to the young, by the high temperature of the blood, and by breathing organs in the form

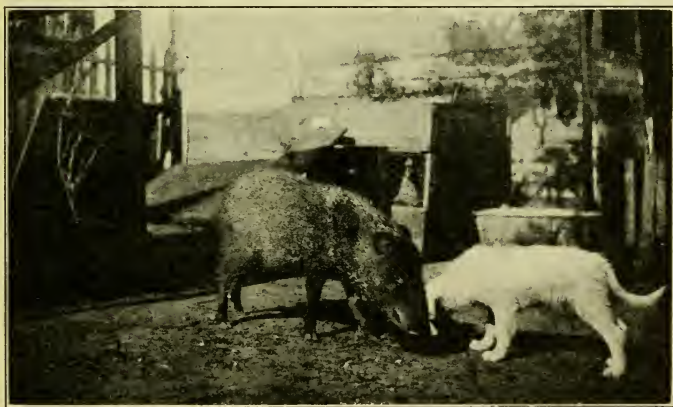


FIG. 40. TEXAS PECCARY OR WILD HOG

of lungs. As representatives of this class in Texas the following animals may be mentioned:

1. *The Texas Opossum*: widely distributed.
2. *The Nine-Banded Armadillo*: entering Texas from Mexico; occasionally found as far to the north and east as Austin.

3. *The Texas Peccary*: formerly ranging from southwestern Arkansas through Texas. This hoglike animal is now found in the southwestern part of the state.
4. *The Texan or Fan-Tailed Deer*: found in southwest Texas. This small deer is an allied species of the Virginia deer.
5. *The American Bison or Buffalo*: practically extinct as a wild animal in Texas since 1880. A herd is maintained on the Goodnight ranch, near Goodnight, Armstrong county, and representatives may be seen at Brackenridge Park, San Antonio.



FIG. 41. AMERICAN BISON OR BUFFALO

6. *The Rabbit*: several species. The long-ear or jack rabbit frequents the open or prairie regions of the state, while the cottontail seeks the more sheltered or forest-covered areas.
7. *The Prairie Dog*: "Dog towns" are common on the western plains.
8. *The Squirrel*: several species. The "fox squirrel" is one of the best known. It frequents pecan groves in abundance.
9. *The Bat*: many species; common in caves. Bat caves are found in Burnet, Williamson, Lampasas, Gillespie, and several other counties of the state.

10. *The Skunk*: rather common.
11. *The Raccoon*: somewhat common in timber, becoming rarer as the larger growth diminishes westward.
12. *The Civet Cat* or *Texas Bassaris*: probably a visitor from Mexico.
13. *The Bear* or *Black Bear*: formerly common in the eastern forested portion of the state. Now driven in retreat to more inaccessible places in the canebrakes and river valleys and farther west.
14. *The Coyote* or *Prairie Wolf*: a widely distributed animal or a series of allied varieties ranging over the western plains of the United States.
15. *The Mexican Jaguar*: a large catlike animal found in southern Texas, which, like the civet cat, has probably invaded the state from Mexico.

61. Birds. Greater interest has probably been accorded to the class of birds than to any other of the animal kingdom. There are, indeed, few people who are not attracted by the song, flight, color, or nesting of birds. Like other Gulf states, Texas is favored with an interesting bird fauna which ranges from the marine forms of the coast to those frequenting the great plains or the Llano Estacado. Much of this life is of a migratory character, yet we know the visitors so well that, overlooking their periods of absence, we come to regard them as characteristic of the state.

In the following list are included most of the common species, but in one or two instances forms are mentioned which have been nearly exterminated by the murderous assaults of the plume hunters.

1. *The Mocking Bird*: the Texas song bird; widely distributed. "He sings all day, and often — if we would believe his audiences — he sings down the chimney all night, and when camped in mockerland in the full of the moon you can almost credit the contention" (Florence Merriam Bailey).¹

¹ *Handbook of Birds of the Western United States*, p. 436. Boston and New York: Houghton, Mifflin & Co., 1902.

2. *The Cardinal or Redbird*: "a bird of striking appearance and brilliant vocal powers, resident and abundant from the Middle States southward; inhabits thickets, tangle, and undergrowth of all kinds, whence issue its rich rolling whistling notes, while the performer, brightly clad as he

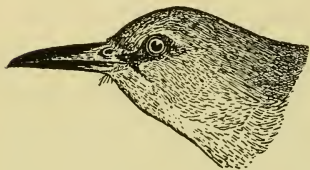


FIG. 42. MOCKING BIRD

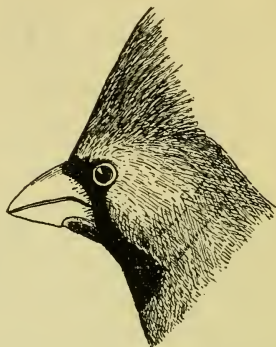
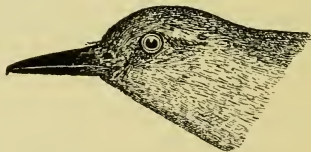


FIG. 43. CARDINAL OR REDBIRD

is, often eludes observation by his shyness, vigilance, and activity" (Elliott Coues).¹

A gray-tailed variety occurs in the vicinity of Corpus Christi.

3. *The Lark Sparrow or Lark Finch*: a common Texas bird of wide distribution. Head marked with chestnut brown, black, and white. Upper parts grayish brown, with black stripes on the back. Under parts grayish brown. A black spot on the breast. Tail tipped with white.

FIG. 44. LARK SPARROW OR
LARK FINCHFIG. 45. SCISSOR-TAILED
FLYCATCHER

4. *The Cowbird, Cow Blackbird, Buffalo Bird*: This blackbird is found over most of the United States, migrating to the South

¹ *Key to North American Birds*, fifth edition, p. 455. Boston: Dana Estes & Co., 1903.

in winter. It receives the name of cowbird from its habit of perching on cattle in order, it is said, to search for parasites.

5. *The Scissor-Tailed Flycatcher* or *Texan Bird of Paradise*: notable on account of its long tail feathers, which are especially displayed in flight, opening and closing like a pair of scissors blades. Common in the prairie and lightly wooded districts.
6. *The Golden-Fronted Woodpecker*: abounds in central and southern Texas. Common at San Antonio and along the foot of the plains. According to Dr. Sennett it is as bold and noisy as the red-headed woodpecker of the North.
7. *The Texas Woodpecker, Ladder-Backed Woodpecker, or Speckle-Check Woodpecker*: found in the region of the Rio Grande and in the valleys and mountains of Trans-Pecos Texas. In habits it is very similar to the downy woodpecker. Frequents chaparral and mesquite growths.
8. *The Road-Runner, Chaparral Cock, Snake-Killer, Paisano, or Ground Cuckoo*: "a bird of remarkable aspect, noted for its swiftness of foot; aided by its wings held as outriggers, it taxes the horse in a race; feeds on fruits, reptiles, insects, land mollusks, sometimes small mammals and birds" (Coues).¹
Common from Austin to the Rio Grande.
9. *The Texas Screech Owl*: a small gray or red form found in southern and western Texas.
10. *The Audubon Caracara*, sometimes called the *Mexican Buzzard*: widely distributed along the southern border of the United States from Florida to Lower California. This large bird is of striking appearance, having a dark blackish body with a white collar barred with black on its lower side. Like the turkey vulture, it congregates in considerable numbers about carrion.
11. *The Mississippi Kite*: adult bird of a dark ashy gray color, head lighter, tail and wings black, the latter crossed by a grayish band. Frequents the southern states as far west as western Texas.

"This sturdy little kite, with its quick flight and graceful form and motions, has much the appearance of a falcon, but its weak bill and talons give it an unfalcon-like character and

¹ *Key to North American Birds*, p. 606.

mode of life. Its prey, instead of being birds and mammals, is mainly of such low order as insects, snakes, and frogs, and its hunting consequently lacks the excitement of the chase. It is seen flying low over the prairies among the brush patches, or going from tree to tree along the streams" (Vernon Bailey).¹

12. *The Turkey Vulture* or *Turkey Buzzard*: one of the best known birds of the South and West; a natural scavenger or carrion feeder. Common in Texas.
13. *The Mourning Dove*, *Turtle Dove*, or *Carolina Dove*: widely distributed and readily recognized by its cooing. In the more arid parts it seeks the water holes and streams in the morning



FIG. 46. TEXAS BOB WHITE

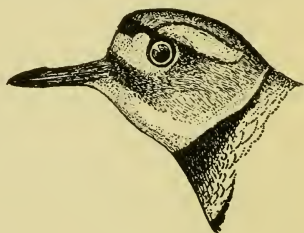


FIG. 47. KILLDEER

and evening. Usually feeds upon the ground, taking flight to trees when disturbed.

14. *The Texas Bob White* or *Texas Quail*: recognized by its whistle. A variety of the Virginia quail, but paler in color, the "prevailing shade rather gray than brown." Frequents thickets and undergrowth, Texas to Kansas.
15. *The Killdeer*, *Kildeer Plover*, or *Kildee*: widely distributed. "A very noisy bird — the curious name is derived from its shrill two-syllabled whistle, like *kil-deer! kil-deer!* and may be spelled in four ways on good authority — *killdeer*, *kildeer*, *kildur*, *kil-dee*" (Coues).²

¹ *Handbook of Birds of the Western United States*, by Florence Merriam Bailey, p. 150.

² *Key to North American Birds*, p. 775.

16. *The Plover*: several species. This is considered one of the Texas game birds. The golden plover is found early in the spring, when it sojourns for a time and then resumes its northward flight. The Wilson plover frequents the Coastal region, and the mountain plover is found in the region of the Staked plains.
17. *The Snipe, Common Snipe, or Wilson Snipe*: another game bird. The southward migration of this species reaches Texas about October and continues for some weeks. Found about springs and on the coast.
18. *The Snowy Heron, Little White Egret, or "Bonnet Martyr"*: one of the plume birds, very rare on the Gulf coast. Formerly abundant at Corpus Christi. Found also in the salt marshes near the mouth of the Rio Grande, and occasionally at Galveston and other coastal points. Nearly exterminated by the millinery bird hunters for the sake of its plumes.
19. *The American Coot, Mud Hen, Crow Duck, Blue Peter*: a slate-gray bird, becoming olive on the back; head and neck darker; toes scalloped on their edges. Ranges over the whole of North America. Common at Corpus Christi, Galveston, and elsewhere on the coast.
20. *The Canada Goose, Wild Goose, Brant*: distributed like the preceding over all of North America. Found on the Gulf coast during the winter migration. The hoarse *honking* of the wild geese as they fly southward just preceding the winter cold is especially noticeable at night.
21. *The Teal*: two species, the green-winged and the blue-winged. These ducks are rather common, and at the proper season are offered for sale at the markets.
22. *The Mallard*: "the best known of all the American ducks." Like the domestic duck in general appearance. The male has a glossy green head (for which reason it is sometimes called the "Green-head") followed by a white ring. A game bird of the state at the proper season.
23. *The Pelican*: two species, the American white and the brown pelican. These birds are at once recognized by the pouch beneath the lower mandible, that of the brown species being the larger.

24. *The Ring-Billed Gull, Common American Gull*: distributed over all of North America, coastwise and inland; migrates to the South for winter. Common at Corpus Christi and Galveston during March and April. In its general appearance this bird is white, with a pale gray mantle covering its back and wings.

62. Reptiles and Amphibians. The animals representing these classes are, in general, readily recognized. To the

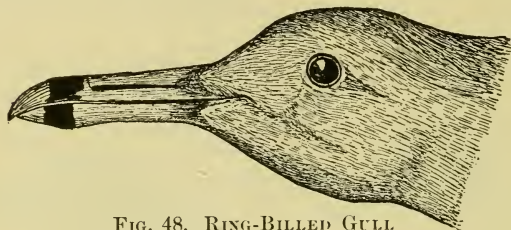


FIG. 48. RING-BILLED GULL

reptiles belong the crocodilians, turtles, lizards, and snakes; to the amphibians, the salamanders, frogs, toads, and other less common forms.

The following are some of the more important reptiles of the state.

CROCODILIAN

1. *The Alligator*: found along the coastal region; especially abundant in the Nueces river.

TURTLES

1. *The Painted Box Turtle*: common in central Texas; frequents the grassy flats from Waco to McGregor (Strecker).
2. *The Snapping Turtle*: common in creeks and rivers.
3. *The Louisiana Mud Turtle*: found in marshes and water holes.
4. *The Soft-Shell Turtle*: common in creeks.

LIZARDS

1. *The Carolina Anolis or Green Lizard*: widely distributed from the Rio Grande to Florida; rare in McLennan county (Strecker).

2. *The Texan Rock Lizard*: "the characteristically abundant form of western Texas. I found it in the first plateau country to the heads of the Medina and Upper Llano. . . . It runs with great rapidity, with its tail generally curved upward, displaying the black spots on the lower side. It prefers rocky ground and does not ascend trees under ordinary circumstances" (Cope).¹
3. *The Tree Swift or Scaly Lizard*: greenish yellow above, "with a series of dark transverse dorsal bands." Western and south-western Texas. Found in wooded regions.
4. *The Fence Lizard*: "This lizard is found all over Texas and is very variable in its characters. . . . The colors are often brilliant, especially in specimens from near San Antonio, where the side of the neck and head are often of a bright rufous and the tail reddish and yellowish brown at the base. It is very abundant from Dallas west to Fort Concho, and southwest to San Antonio, and in the first plateau region to the head of the Medina river. It is found on the ground, but always takes refuge in trees, running on and around the limbs with great agility" (Cope).²
5. *The Horned Lizard, Horned Toad, or Horned Frog*: one of the most common of the Texas lizards. Ranges from the Gulf as far north as central Kansas and Colorado. Closely allied species occur in California, Arizona, Utah, the Upper Missouri region, and Mexico.

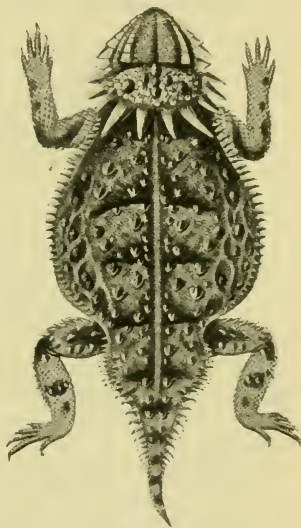


FIG. 49. HORNED LIZARD, COMMONLY CALLED HORNED FROG OR TOAD

From Baird

¹ "The Crocodilians, Lizards, and Snakes of North America." *Report of the United States National Museum*, 1898, p. 289.

² *Loc. cit.*, pp. 379-380.

6. *The Sir-Lined Lizard*: "dark brown above, marked with six yellow longitudinal lines, all but two of which disappear on reaching the tail. . . . Below, the scales are smooth and of a silvery-blue color."

Reported from many and widely separated localities in the state: Rio Pecos, Laredo, Galveston, New Braunfels, Fort Davis, McLennan county, Cook county.

SNAKES

1. *The Spreading Adder, Viper, or Hog-Nosed Snake*: "Body short and stout. Tail very short, and rapidly tapering, rather thicker than the thinnest part of the body. . . .

"Color reddish brown above, with dark blotches. . . . The blotches anteriorly are nearly square, posteriorly they are transversely elongated. . . .

"This species is subject to great variations of color. Sometimes the sides of the dorsal blotches pass insensibly into the ground color, so as to become transverse bands. At others they are light internally, with a narrow margin of black" (Cope).¹

Widely distributed from the Red river to the Gulf.

2. *The Racer or Black Snake*: receives the name of Black Snake from the lustrous pitch-black color of the upper side of the body, which becomes slaty to greenish white beneath. Some of the Texas specimens are bright yellow beneath, and of an olive green above. Both forms are reported from McLennan county.
3. *The Coach-whip*: body long and slender, black or brownish above, gradually fading towards the tail. Common.
4. *The Pilot Snake*: of an ash-gray color marked with a series of forty-two to forty-seven dark chocolate-brown blotches. Found in the timbered region of eastern Texas. One of the commonest snakes in the timbered portions of McLennan county (Strecker).
5. *The Bull Snake*: body yellowish brown marked "with three series of dorsal black blotches, forty-five to sixty-five in number," counting from the head to the beginning of the tail, and with twelve on the tail. A widely distributed species in the state.
6. *Say's King Snake*: "The scales on the back and sides are lustrous black, each one with a . . . spot of ivory white, which on the

¹ Loc. cit., p. 763.

sides occupy nearly the whole of the scale, but are smaller towards the back. . . . Beneath yellowish white, with broad distinct blotches of black, more numerous posteriorly" (Cope).¹

Common in central and southern Texas.

7. *The Diamond Water Snake*: the ground color above, brown, which by a combination of dots and transverse black bands is blocked off in "a series of transverse diamond-shaped or hexagonal spaces." Yellow below. A common species in Texas. Found along creeks.
8. *Say's Garter Snake*: a slendersnake, "deep brown to black above and on the sides; beneath greenish white." Dorsal stripe ocher yellow; lateral stripe greenish white or yellow. It ranges from Dallas or farther east to the Rio Grande and beyond in Mexico.²

THE POISONOUS SNAKES OF TEXAS³

1. *The Harlequin Snake*, also known as the *Coral Snake* and the *Candy-stick Snake*: a highly colored form, usually easily recognized by its general appearance, which is that "of a succession of red and black rings." Common in the Coastal region. Reported from the Rio Grande and Rio Pecos valleys and from McLennan county.
2. *The Copperhead* or *Dry Land Moccasin*: head dark and bronze colored. General color light chestnut. The inverted Y-shaped



FIG. 50. HARLEQUIN OR CORAL SNAKE

From Baird

¹ Loc. cit., p. 912.

² Cope. Loc. cit., pp. 1022-1023.

³ The list here given is, with a single omission, that compiled by Mr. J. D. Mitchell of Victoria, Texas. See "The Poisonous Snakes of Texas, with Notes on their Habits." *Transactions of the Texas Academy of Science*, Vol. V., pp. 21 et seq. Austin, 1903.

darker blotches on the sides furnish further means for identification.

It frequents the timber bordering rivers and creeks.

3. *The Cottonmouth, Water Moccasin, or Stump-Tail Moccasin*: young individuals of a somewhat dull chestnut brown above, marked by twenty or thirty purplish-black transverse zigzag bands, two of which, on the same side, may unite above inclosing a space darker than the ground color. The underside of the body is black, with yellowish-white blotches. Upper side of the



FIG. 51. COTTONMOUTH OR
WATER MOCCASIN

From Baird

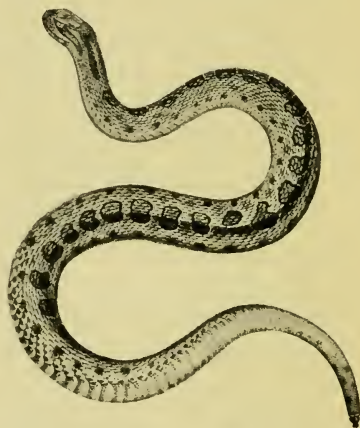


FIG. 52. EDWARDS' MASSASAUGA

From Baird

head purplish black. In old individuals the color is faded and "the general appearance is dark, rough, and rusty."

It ranges all over the state where there is sufficient moisture.

4. *Edwards' Massasauga*: yellowish brown; "about forty-two dorsal brown and irregular blotches, margined with deep black and encircled with a yellow fillet . . ."; sides marked with small chestnut-brown blotches arranged in two series. Said to range throughout Texas, but apparently is not very common.
5. *The Ground Rattlesnake*: "ground color dark grayish ash, minutely mottled. A series of thirty-eight to forty-five subcircular

dorsal blotches extending from head to tail, dark brown, each with a narrow distinct yellowish border. Interval rather narrower than the spots themselves. A broad band of purplish red passes from head to tail through the blotches.”¹

Common in all parts of the state.

6. *The Diamond Rattlesnake*: “general color yellowish gray, with rhomboidal black blotches, lighter in the center, and with the angles perfect.”²

Found in the timbered river bottoms of the coast country.

7. *The Texas Rattlesnake*: “ground color above dull yellowish brown, with a series of subhexagonal patches from the head nearly to the tail, in an uninterrupted series separated throughout by narrow lines.”³

Found in western Texas and the coast country as far east as Matagorda county.

8. *The Banded Rattlesnake*: color above from tawny yellow to dark brown; beneath, whitish yellow to dark gray. It receives its name from “a dorsal series of more or less irregular and imperfect transverse bands” or blotches.

Frequents the timber. Found in widely separated localities where proper conditions prevail.

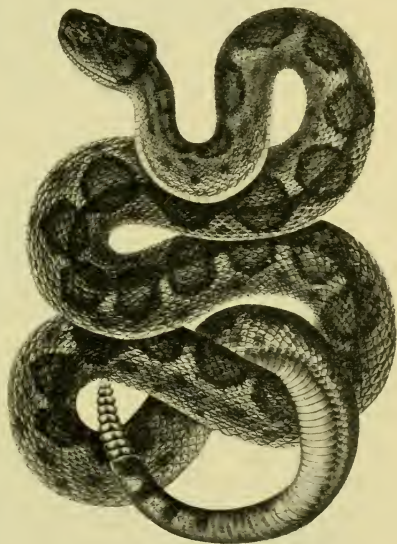


FIG. 53. TEXAS RATTLESNAKE

From Baird

¹ See “The Poisonous Snakes of North America,” by Leonhard Stejneger. *Report of the United States National Museum for the Year ending June 30, 1893*, p. 419. Washington, 1895.

² Loc. cit., p. 434.

³ Loc. cit., p. 437.

9. *The Dog-Faced Rattlesnake*: "general color above that of roll sulphur; beneath pale yellowish. Posteriorly, very faintly clouded with brownish. Tail black. . . . Along the back is a series of transverse reddish or chestnut-brown lozenges. . . . These lozenges are frames with the outlines generally one scale in width, and with the centers of the ground color; sometimes divided by a median line of brown so as to show two yellowish spots inside of lozenges."¹
Reported from the Rio Pecos region.
10. *The Prairie Rattlesnake*: a yellowish-brown snake marked with a series of dark subquadrate blotches, having their corners rounded and anterior and posterior sides frequently concave.²
Reported from northwest Texas.
11. *The Green Rattlesnake*: greenish gray above; body marked by nineteen black rings which are not joined on the underside.
Found in the valley of the Rio Grande.

Among the amphibians of the state may be mentioned several species of toads, of which the American toad is a common form, several species of tree frogs, the leopard frog, and the bullfrog.

63. Fishes. The class of fishes includes aquatic gill-breathers having the body protected by scales, bony plates, or a leathery integument, and limbs in the form of fins.

"With regard to its fresh-water fishes, Texas is chiefly remarkable for the abundance of species in its lowland streams. A large proportion of its species are confined chiefly or almost wholly to the streams of the narrow strip known as the Coast plain region. The lower portion of the larger streams crossing this teem with many species of valued food fishes, such as the channel cat, chuckle-headed cat, mud cat, buffalo, large-mouthed black bass (the 'trout'

¹ Loc. cit., p. 425.

² Loc. cit., p. 442.

of the South), various species of sunfishes, and the freshwater drum.”¹

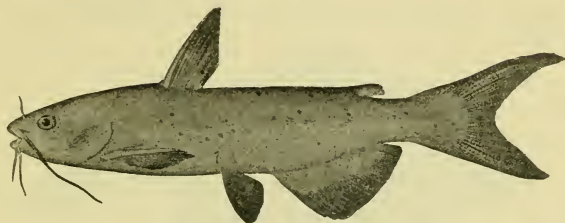


FIG. 54. CHANNEL OR EEL CAT

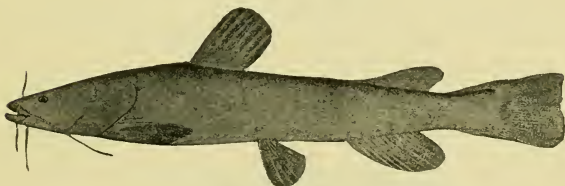


FIG. 55. YELLOW OR MUD CAT

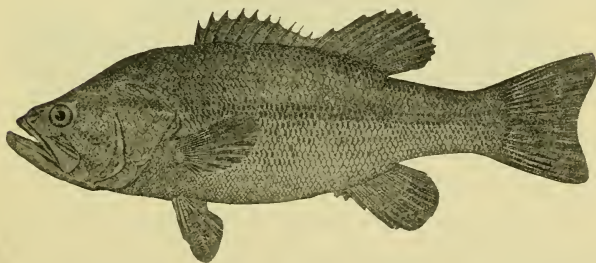


FIG. 56. LARGE-MOUTHED BLACK BASS

While an enumeration of all the fishes well known in Texas is not attempted, the most noticeable or important

¹ Evermann and Kendall, "The Fishes of Texas and the Rio Grande Basin." *Bulletin of the United States Fish Commission for 1892*, p. 95.

from an economic standpoint are the following: the shovel-nosed shark, the sawfish, the sting and other rays, several species of garfish, catfish, including the forms above

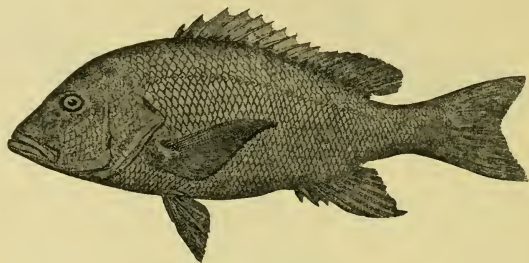


FIG. 57. RED SNAPPER

mentioned and many others, a variety of suckers, many species of minnows, herrings, sunfish, darters, the sea bass,

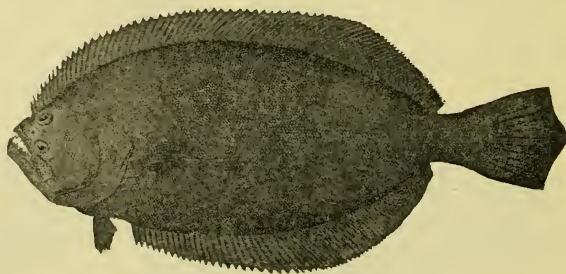


FIG. 58. SOUTHERN FLOUNDER

the red snapper, croakers and flounders, as well as some fish of unusual shapes, such as the angel fish or moonfish, the toadfish and the trunkfish. It will be noted that many of the fishes above given are salt-water species.

Fishing on the coast of Texas is an important industry. For the year ending August 31, 1904, 7,338,843 pounds were taken, valued

at \$291,753, of which 3,151,489 were of Red Snapper, landed at the port of Galveston, valued at \$126,059.¹

64. Invertebrates. Concerning the invertebrates much might be said. Arthropods, animals having jointed appendages, abound. This branch of the animal kingdom is represented by crustaceans, insects, spiders, and myriapods. To the crustaceans belong such animals as crayfish, crabs, and shrimps; to the insects, bees, ants, wasps, butterflies, moths, beetles, flies, gnats, mosquitoes, snake doctors, etc. Of the noxious insects of the state the boll weevil is probably best known. The most striking example among the spiders is the tarantula, and among the myriapods, the centipede.

By many persons the shrimp is highly esteemed as a delicacy, and thousands of pounds of this little crustacean are annually shipped from the coast to interior points.

The branch of mollusks is represented in the state by over five hundred species. Here are included the snails, or gastropods, the bivalves, or pelecypods (shellfish such as the oyster, clam, etc.), and other forms of interest to the zoölogist.

The mollusks, as to their habits and distribution, may be divided into terrestrial, fresh-water, and marine species. The last includes by far the greater number. A consideration of lower forms of the invertebrates is omitted, as the subject is too intricate for a book of this character.

The cultivation of the oyster is an important industry on the Gulf coast. While the product of the beds in the vicinity of Corpus Christi is well known for the general excellence of its flavor, the largest shipments of this bivalve are made from Port Lavaca in Calhoun county.

¹ *Report of Fish and Oyster Commissioner of the State of Texas* (I. P. Kibbe) for the Year ending August 31, 1904, p. 13.

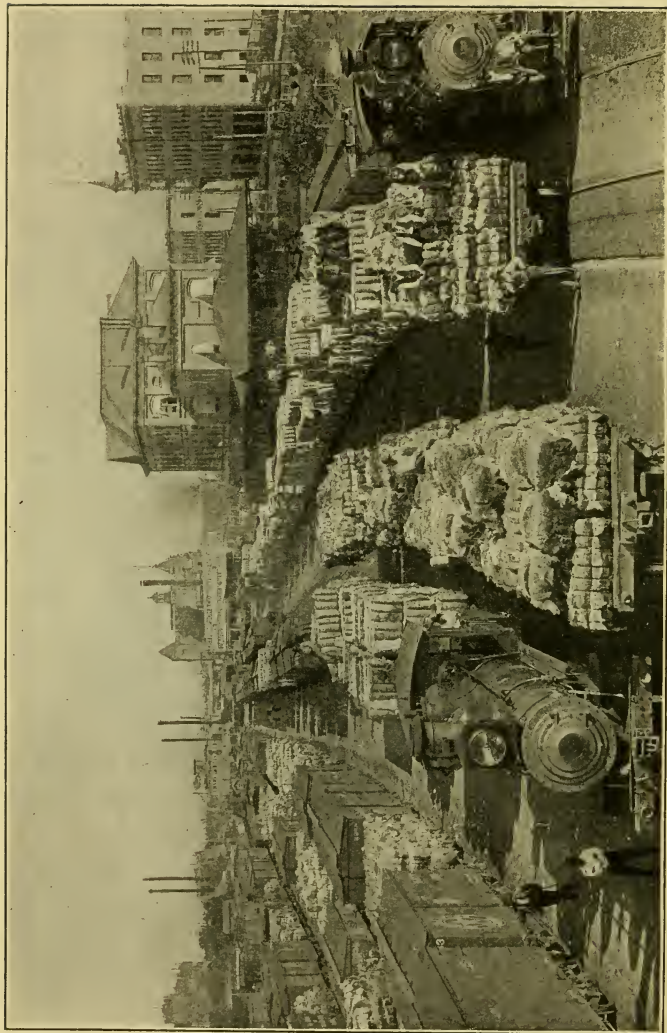


FIG. 59. COTTON IN THE RAILROAD YARD AT HOUSTON

CHAPTER VIII

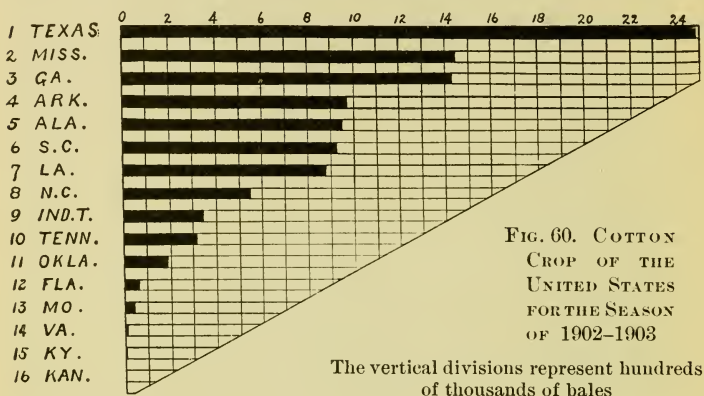
INDUSTRIES

65. Agriculture. Notwithstanding the arid condition of the plateau country and the desert character of much of the Trans-Pecos region, Texas is a leading state in agriculture and is destined soon to occupy the foremost place. The fertility of its prairie and alluvial soils is unexcelled, and its wide range of climatic conditions — temperature and rainfall — favors a tropical and semitropical growth in the south and a growth of the temperate regions in the north. Thus within the domain of this great “empire” cotton and corn, wheat, oats, and rice, sugar cane and tobacco, vegetables and fruits can be successfully grown, not to mention other plants useful for forage.

66. Cotton. Texas produces more cotton than any other state in the Union. For the season of 1900–1901 it amounted to 3,526,649 bales of 500 pounds each. This is the largest crop made in the state up to the present time (1905). In the accompanying diagram (Fig. 60), the entire cotton crop of the United States for the season of 1902–1903 is shown. It will there be seen that Texas leads the next following state, Mississippi, by over a million bales. The Map of the Texas Cotton Belt (Fig. 61) includes all the counties which produced over 10,000 bales during the census year (1899).

In addition to the fiber, which is manufactured into cloth and batting, the seeds of the cotton plant yield a

valuable oil which is widely used for a variety of purposes and even as a substitute for olive oil. In the state there are over one hundred and fifty cotton-seed-oil mills, one of the largest in the world being located at Sherman. Cotton-



seed hulls, and the ground cake called "meal," from which the oil has been expressed, are valuable for stock feeding.

67. Cereals. The leading cereals of the state are, in the order of their importance, corn, wheat, oats, and rice. Barley and rye are raised in small amounts.

The corn crop for 1904 reached 136,702,699 bushels, having a value of over seventy-one million dollars.¹ The leading corn-producing counties² are Collin, Grayson, Dallas, Ellis, Fannin, Hill, Williamson, Hunt, McLennan, Bell, and Lamar.

The wheat crop for 1904 amounted to 12,483,562 bushels, valued at over thirteen million seven hundred

¹ *Crop Reporter* (supplement) published by authority of the Secretary of Agriculture, Vol. 6, No. 8, p. 66. Washington, D.C., December, 1904.

² Based on the *Report of the Twelfth Census*.

thousand dollars.¹ The leading wheat-producing counties² are Collin, Denton, Tarrant, Grayson, Cooke, and Ellis.

The oat crop for 1904 reached 28,688,320 bushels, valued at over twelve million six hundred thousand dollars.¹

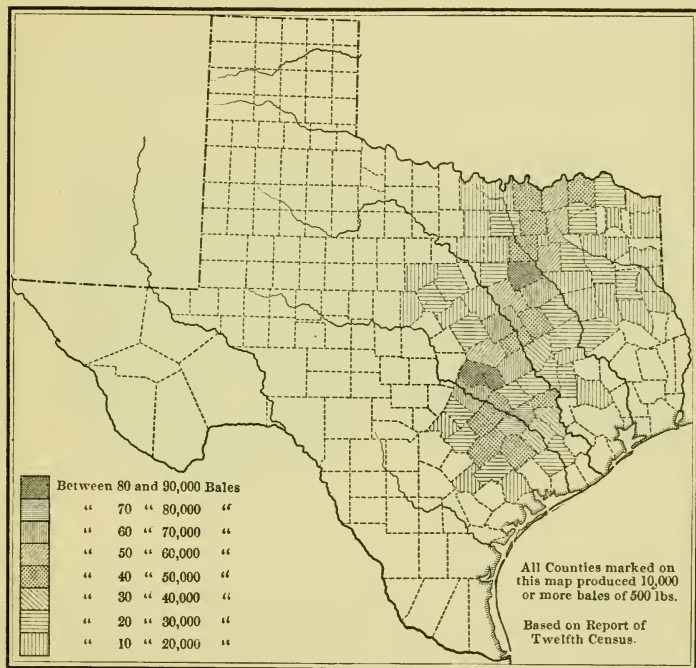


FIG. 61. MAP OF THE TEXAS COTTON BELT

The leading oat-producing counties² are Grayson, Collin, Hill, Hunt, Dallas, McLennan, Ellis, and Fannin.

¹ *Crop Reporter* (supplement) published by authority of the Secretary of Agriculture, Vol. 6, No. 8, p. 66. Washington, D.C., December, 1904.

² Based on the *Report of the Twelfth Census*.

The "rice belt" of the state borders the Gulf, extending from the Sabine river to the Rio Grande. As the crop is raised mainly by irrigation, this belt has rapidly spread inland until it has now reached Chappel Hill on the Brazos, Columbus on the Colorado, and Cuero on the Guadalupe.

A few years ago two general rice-producing sections were recognized in Texas, the Beaumont and the Colorado



FIG. 62. A TEXAS COTTON FIELD

river valley sections.¹ These two sections are now practically blended and are further increased by the rice-producing counties along the Guadalupe river. This enlarged section extends along the coast from the Louisiana line to the Guadalupe river, embracing the following counties: Orange, Jefferson, Chambers, Liberty, Galveston, Harris, Brazoria, Fort Bend, Waller, Matagorda, Wharton, Colorado, Austin, Jackson, Calhoun, Victoria, and Dewitt.

¹ "Rice Irrigation in Texas," *Bulletin of The University of Texas*, No. 16, 1902, p. 13.

A second, or Rio Grande, section includes the irrigated rice farms of Cameron county.

For the year 1904 the rice acreage of the state has been estimated at 234,200 acres and the rice crop at 8,314,100 bushels, valued at \$5,487,306.¹



FIG. 63. MAP OF TEXAS SHOWING THE RICE BELT AND THE EAST TEXAS FRUIT REGION

68. Fruit and Vegetables. Fruit raising has become in recent years an important industry. The soils of East Texas are especially adapted to the growth of fine peaches, and one variety, the Elberta, has won an excellent reputation not only at home but in the northern markets. In

¹ *Crop Reporter* (Supplement), Vol. 6, No. 8, p. 67.

southern Texas strawberries and similar fruits ripen early, and their successive appearance follows in a procession across the state. Within the limits of sufficient rainfall, especially in the eastern and southern parts of the state, and beyond, where irrigated, vegetables grow in the greatest profusion. In fact, the raising of small fruits and vegetables is an industry capable of almost infinite expansion.

Watermelons are shipped in large quantities from San Patricio, Waller, Bee, and Dewitt counties in southern Texas, and from Smith county in eastern Texas. Galveston and Brazoria counties lead in the production of strawberries, followed by Smith county. The principal points of shipment of East Texas peaches are Tyler, Swan, and Lindale in Smith county, and Jacksonville in Cherokee county. Nueces and Bee counties lead in the production of vegetables, which are successfully grown in the coast country, for the distance of a hundred miles inland, and also in eastern Texas. While tomatoes are raised in the greatest abundance in the latter region, especially in Smith, Cherokee, and Nacogdoches counties, they are also extensively grown in the Coastal belt and in many other localities under irrigation.

Within the last few years attention has been directed to the cultivation of the Irish potato, and with such success that the crop for 1904 reached 2,246,112 bushels, valued at over two million dollars. At Laredo, Cotulla, and other points excellent onion crops have been secured.

69. Nuts. An important nut crop is furnished by the pecan trees which fringe the streams in the central and south central parts of the state, especially in San Saba, Brown, Lampasas, Coleman, Colorado, and Bexar counties.



FIG. 64. JAPANESE RICE FARMERS NEAR PORT LAVACA,
CALHOUN COUNTY

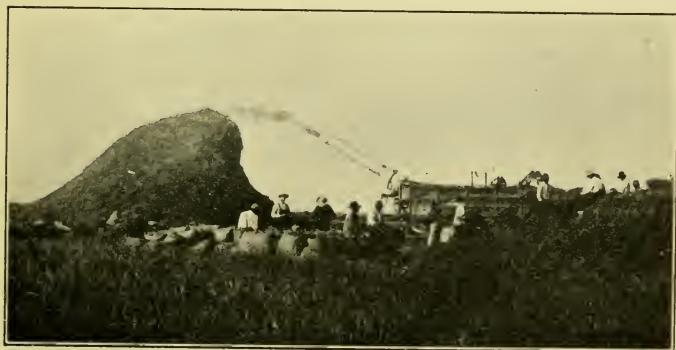


FIG. 65. RICE THRESHING AT RAYWOOD, LIBERTY COUNTY,
ON THE TEXAS AND NEW ORLEANS RAILROAD (SOUTHERN
PACIFIC)

Nuts of a good quality are always in demand and meet with a ready sale. It would seem that the cultivation of this tree would be profitable, as there are many parts of the state where it could be successfully grown.

70. Other Agricultural Products. The production of hay and forage crops is an industry of much importance. They include prairie grasses, millet, alfalfa, and certain of the grains and cane sown for forage and cut green. The hay crop for 1904 was valued at over five million eight hundred thousand dollars.

In acreage of sorghum cane Texas ranks third.

The growth of sugar cane is confined to the southern portion of the state, and the production of sugar is an industry not yet fully developed. The farms are chiefly in Fort Bend, Wharton, Matagorda, Colorado, Brazoria, and Cameron counties.

The state has a plantation of 8210 acres in the sugar district of Wharton county upon which convict labor is employed. A large and costly sugar mill has been erected there. One of the largest mills and refineries in the South is situated at Sugarland, Fort Bend county, twenty-four miles southwest of Houston.

Among the miscellaneous agricultural products may be mentioned broom corn, tobacco, and peanuts. The cultivation of tobacco is an industry full of promise. The crop for 1904 was valued at over fifty-four thousand dollars.

71. Stock Raising. On account of the diminished rainfall the western half of the state is unsuited to agriculture. In this region, which includes a large part of the Central basin, the Llano Estacado, the Edwards and Stockton plateaus, and the Rio Grande plain, stock raising is



FIG. 66. TEXAS COWBOYS



FIG. 67. CATTLE AT A WATER TANK ON THE PLAINS

the chief industry. Great herds of cattle, not to mention numberless sheep and horses, here find a growth of

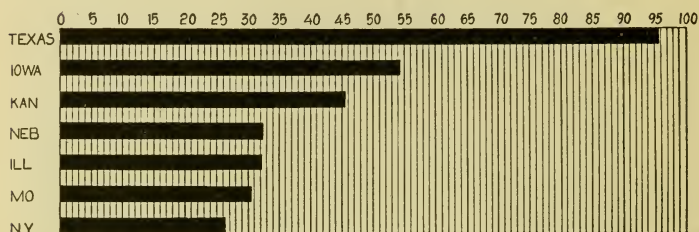


FIG. 68. DIAGRAMMATIC ILLUSTRATION OF THE NUMBER OF NEAT CATTLE IN THE LEADING STATES

The vertical divisions indicate hundreds of thousands

nutritious grasses which afford them an excellent support. This is the land of the cowboy and large ranches. In



FIG. 69. A WEST TEXAS RANCH HOUSE ("—N— RANCH")

the number of beef cattle Texas ranks first of all the states.

On January 1, 1905, the number of horses in Texas was 1,277,000, valued at \$45,308,000; the number of mules,

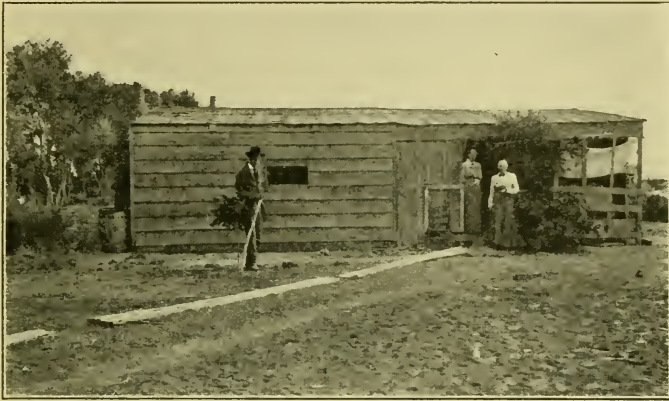


FIG. 70. A PECOS COUNTY RANCH HOUSE, SANTA LUCIA

391,000, valued at \$23,800,000; the number of milch cows, 838,000, valued at \$16,617,000: and 8,249,000



FIG. 71. ANGORA GOATS, BOQUILLAS, BREWSTER COUNTY

of other cattle, valued at \$83,260,000. In addition to the horses and cattle there were 1,617,000 sheep, valued at \$3,356,000; and 2,525,000 swine, valued at \$11,817,000.

These figures will serve to show the magnitude of the livestock industry of the state.

72. Wool Growing. Wool growing is an important industry notwithstanding the fact that Texas ranks eighth in the list of wool-producing states. The counties making the largest returns are Edwards, Pecos, Crockett, Valverde, Sutton, Webb, Hamilton, Burnet, Coleman, Kerr, and Lampasas. For the season of 1899-1900 the wool crop of the state was 9,638,002 pounds. In addition to this Texas produces more goat hair (mohair) than any other state of the Union, reaching 274,810 pounds for the season of 1899-1900.

73. Poultry, Honey, and Wax. Texas leads all the states in the number of turkeys raised, and ranks well for chickens, ducks, and geese. The annual valuation of poultry exceeds five million dollars, and that of eggs four and a half million dollars.

Texas also leads in the production of honey. Bee culture is another industry capable of much greater development. At present the largest yields of honey are from Uvalde, Williamson, Travis, Bell, and Coryell counties; and of wax, from Williamson, Houston, Leon, and Milam counties.¹

74. Manufacturing. "Although Texas is an agricultural and stock-raising state . . . there has been a large growth in its manufacturing and mechanical industries during the half century [1850-1900]. The population during these years increased from 212,592 to 3,048,710, while the average number of wage-earners employed in manufacturing establishments increased from 1,066 to 48,153, embracing, in 1900, 1.6 per cent of the entire population, compared

¹ Based upon *Report of Twelfth Census*.

with five tenths of 1 per cent in 1850. Probably the best indication of the importance of the wage-earning class is afforded by the greatest number employed at any one time during the year. In 1900 this was 77,995, or 2.6 per cent of the total population of the state.”¹

75. Manufacturing Industries. The manufacturing industries of the state include shops for the construction of cars and the repair of railroad appliances, saw, planing, and other wood-working mills, cotton-seed-oil mills, flour and grist mills, rice mills, machine shops and foundries, blacksmith and wheelwright establishments, wagon factories, ice factories, cement works, marble and stone works, canneries of fruit and vegetables, tobacco factories, breweries, bottling works, broom factories, candy factories, cotton mills, woolen mills, plants for the manufacture of brick and tile, salt works, printing and publishing establishments, book binderies, harness and saddlery establishments, etc. Here should also be included gins for the seeding of cotton, and compresses for the preparation of the bales for shipment.

The various industries above enumerated will be further treated in the account of the cities and towns of the state in later chapters, and reference will be made to the mining and quarrying industries in the chapter on Mineral Resources following.

¹ *Report of the Twelfth Census*, Vol. VIII, Part II, p. 862.

CHAPTER IX

MINERAL RESOURCES

Of the large number of minerals and mineral substances found in Texas the following are of commercial importance.

76. Coal and Lignite. The fossil fuels included under these names differ in age, composition, and heating power. Of the two, coal is the more valuable. The coals of Texas are found interstratified with the rocks of the Carboniferous and Cretaceous systems. The lignites contain a higher percentage of water and a lower percentage of carbon; they are therefore inferior to the coals as a fuel. The Texas lignites are confined to the Eocene rock system. Although these fuels are not of the highest grade, they are, nevertheless, exceedingly valuable in a large state of which many parts are entirely destitute of timber.

Carboniferous coal occurs in the eastern part of the Central basin. Only two of the nine seams known to exist are at present worked, viz., numbers 1 and 7. The former varies in thickness from fourteen to twenty-eight inches and is extensively mined at Thurber in Erath county. Here the Texas and Pacific Coal Company operates four collieries and has an output of 400,000 tons annually. This seam is also mined near Bridgeport in Wise county, at Rockcreek in Parker county, and near Strawn in Palo Pinto county. Seam number 7 is worked at Cisco and somewhat irregularly in the southern part of Coleman county. It was formerly worked near Bowie in

NORTH TEXAS COAL FIELD FROM THE TEXAS GEOLOGICAL SURVEY

Scale of Miles
0 10 20 30 40

LEGEND

- | | | |
|--------------------------|--|------------------------------|
| | | |
| Cretaceous | Permian and Carboniferous other unclassified sediments | Coal Measures |
| — Outcrop of coal No. 7. | | - - - Outcrop of coal No. 1. |
| ✕ Coal mines | | ✕ Coal prospects |

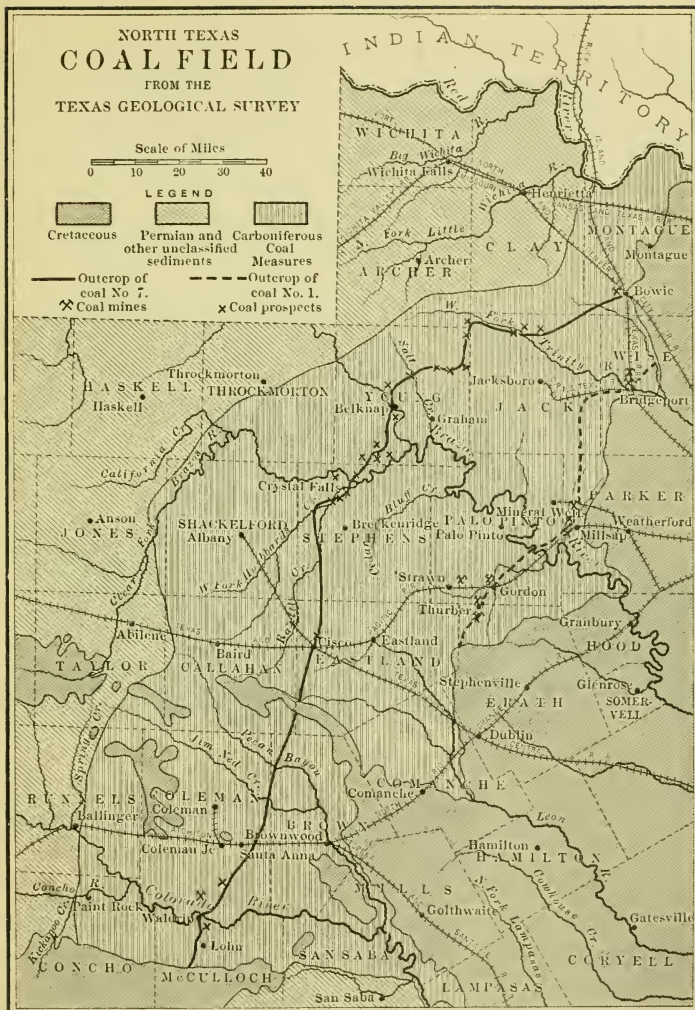


FIG. 72

Montague county. The distribution of the Carboniferous rocks of the North Texas coal fields is shown on the accompanying map (Fig. 72). The northern, known as the Brazos field, is separated from the southern, known as the Colorado field, by a belt of Cretaceous rocks.

Cretaceous coal is mined at Eagle Pass in what has been termed the Eagle Pass or Nueces coal field, which lies in

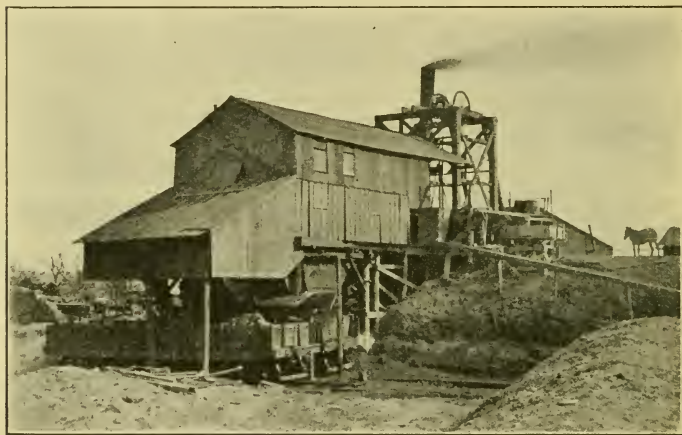


FIG. 73. A TEXAS COAL MINE, THURBER, ERATH COUNTY

Maverick county. The output of two mines is about three hundred tons daily.

Lignite is found in many places along the outcrop of Eocene strata (see map, Fig. 74). In the Santo Tomas coal field, north of Laredo, it resembles true coal. Two mines here furnish an output of about five hundred tons daily. Lignite is also mined near Rockdale in Milam county, Lytle in Atascosa county, Calvert in Robertson county, Crockett in Houston county, Alba in Wood county,

Timpson in Shelby county, and elsewhere in the state. Its seams vary much in thickness. Some exceed ten feet, and there are mines in which more than one seam can be worked.

77. Oil (Petroleum). While oil is widely distributed in Texas, it is found in quantities sufficient for commercial

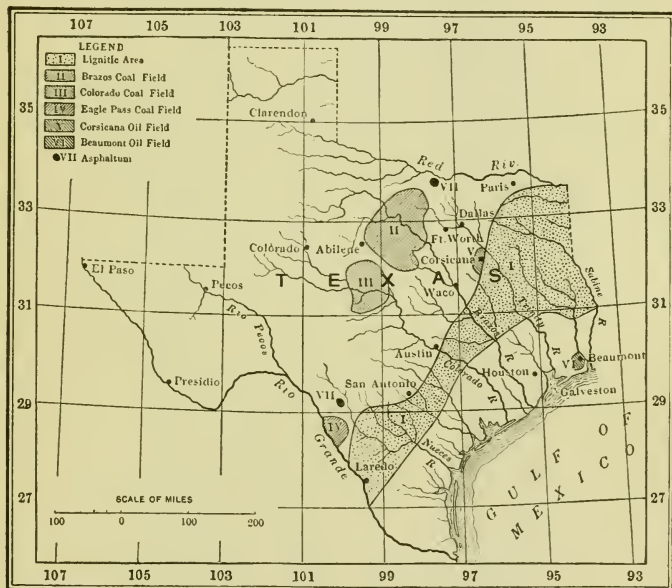
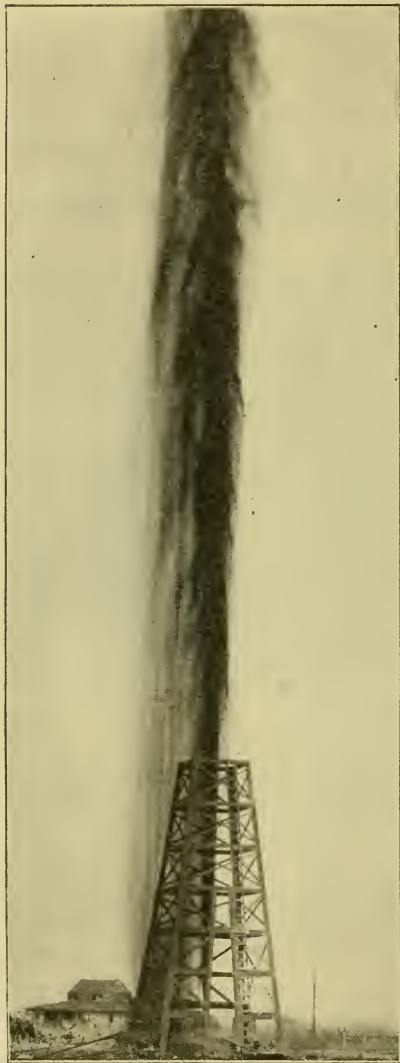


FIG. 74. MAP OF TEXAS SHOWING THE LIGNITE, COAL, AND PETROLEUM AREAS

purposes in but few places. That there are still undiscovered fields there can be little doubt. Its presence beneath the surface is often made known by the occurrence of natural gas (noticed at springs), bitter waters, and asphaltic deposits. It is obtained by boring and is encountered at various depths, ranging in this state from a few



hundred feet to over a thousand feet. Oils from different fields vary in character. Some are suitable for the production of kerosene and gasoline, others are best adapted for fuel purposes, and still others are valuable as lubricants.

The Beaumont oil field, near the city of Beaumont in Jefferson county, has been the most productive. The first well, the forerunner of a large number of "gushers," was brought in January 10, 1901. This was followed by a period of great activity and many wells were put down with good results. They were, however, crowded upon a very limited area known as Spindle-top Heights. In their vicinity great storage tanks have been erected. Several pipe lines connect this field

FIG. 75. THE BEATTY GUSHER, BEAUMONT OIL FIELD, 1901

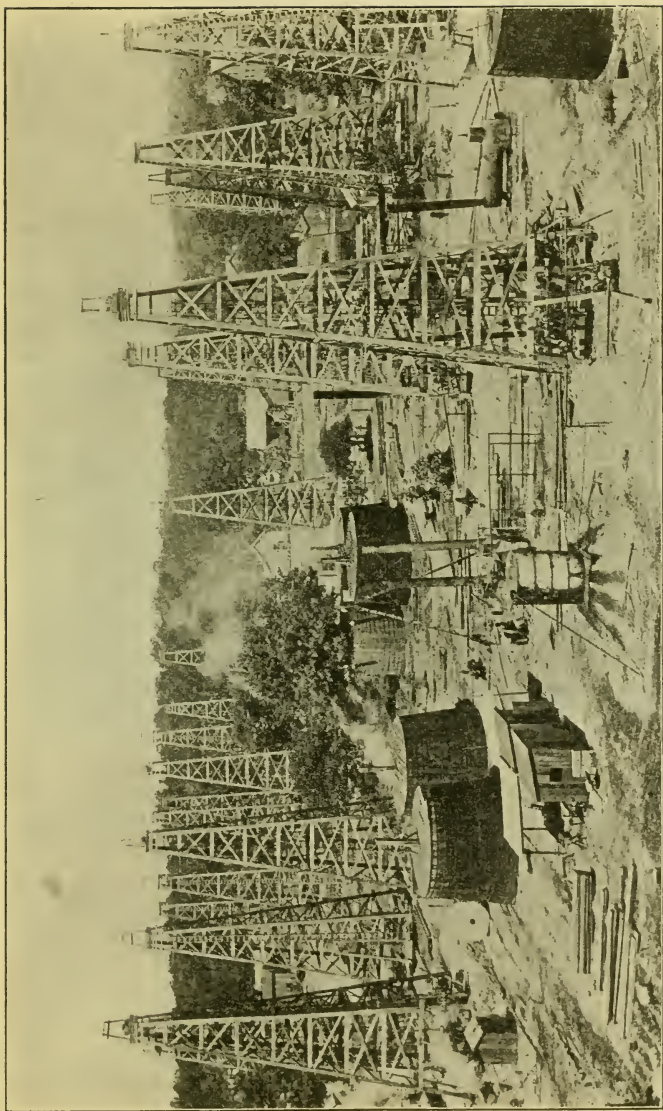


FIG. 76. SCENE IN THE SOURLAKE OIL FIELD, HARDIN COUNTY, 1903

Here are shown the derricks erected for drilling the wells, the engines for operating the drills and for pumping, and the tanks for storing the oil

with the shipping point, Port Arthur, where a large refinery has been erected. The output of the Beaumont field for 1902 was estimated at 18,000,000 barrels. At the present time there is a great falling off, and its practical exhaustion seems near at hand.

The Corsicana oil field is probably next in importance. Petroleum was first discovered here in 1894 while drilling for water. In 1896 it was found to exist in sufficient quantity for shipment and refinement. Since that time the production of oil has been steadily carried on. Corsicana has a refinery, and a second is located at Powell, eight miles to the east.

Valuable flows of oil have also been developed in Hardin county at Sourlake (Fig. 76), Saratoga, and Batson and in Harris county at Humble. Oil in smaller quantities has been encountered in Nacogdoches county, southeast of the town of Nacogdoches, and in Bexar, Travis, Clay, and Brown counties.

78. Asphaltum (Mineral Pitch). Asphalt is a substance closely related to petroleum. It is valuable for the manufacture of paint and varnish, and especially as a pavement material. It is found in deposits of commercial value in Uvalde county, near Saint Jo in Montague county, and near Palestine in Anderson county. It occurs in smaller deposits in numerous other localities.

79. Natural Gas. The occurrence of large volumes of natural gas in the oil fields is a well-known fact. It is also found in many other places in the state. That it is an excellent fuel for both manufacturing and heating purposes and valuable as a luminant, the wonderful development of the Pennsylvania, Ohio, and Indiana gas fields during the last twenty years affords ample proof.

In Texas, as yet, there has been little effort made to utilize this product, notwithstanding the cost of desirable fuel. A beginning, however, has been made at Corsicana for heating purposes, and at Matagorda it is employed in some of the rice-irrigating plants.

80. Iron Ores. Brown iron ore, or *Limonite*, in several varieties, occurs over a large part of northeast Texas, covering portions of nineteen counties and an area of about one thousand square miles (see Fig. 26). It is



FIG. 77. A BURNING GAS WELL NEAR CORSICANA

associated with the rocks of the Eocene system, and the ore beds often form the cap stone of the flat-topped hills in the Forested area (see Fig. 9). There are iron furnaces at Rusk (state penitentiary) in Cherokee county, and at Jefferson in Marion county.

Magnetic iron ore, or *Magnetite*, is found in the Central Mineral region, as is also the Red iron ore, or *Hematite*; but the scarcity of fuel and heavy transportation charges have retarded the manufacture of iron in this

locality. The magnetite and hematite ores of the Trans-Pecos region have not yet been commercially developed, though ore bodies of considerable thickness have been discovered.

81. Quicksilver or Mercury. *Cinnabar*, the ore from which quicksilver is obtained, is mined at Terlingua in

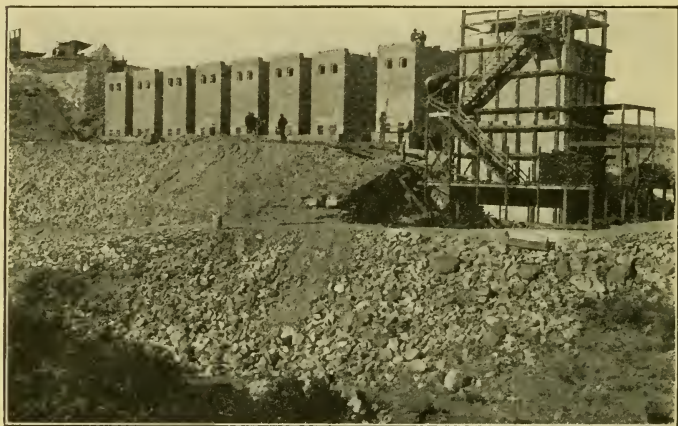


FIG. 78. THE TERLINGUA MINING COMPANY'S FURNACE, TERLINGUA, BREWSTER COUNTY

The cinnabar is roasted in the furnace on the right, and the mercurial vapor given off in the process is conveyed to the condensers on the left, eight in number, where it is cooled to the liquid form, the quicksilver of commerce

Brewster county. The district as now known is rectangular in shape, running east and west, about fifteen miles long by four miles wide. It lies twelve miles north of the Rio Grande. Furnaces for the production of quicksilver have been built and are in operation at Terlingua. Over five thousand flasks of 76.5 pounds each were produced in 1904.

82. Gold and Silver. The precious metals are not to be expected outside of the Central Mineral region, or Llano country,¹ and the Trans-Pecos region. In those parts of the state free gold is obtained in small amounts. Native silver is found in the Trans-Pecos region. It is mined at Shafter,² and is reported as having been found at the Hazel mine north of Allamore in El Paso county. Like gold, silver usually occurs associated with the ores of other metals.

83. Copper and Lead. Copper and lead ores are found both in the Llano country and the Trans-Pecos region, but as yet neither copper nor lead has been produced in commercial quantities.

Copper ores are also found in the Permian rocks of northern Texas, distributed through beds of clay or at times replacing the branches of fossil trees (Archer, Wichita, Montague, Hardeman, Wilbarger, Haskell, Baylor, Stone-wall, and Knox counties).

84. Salt. Salt is found in lakes and seeps and, as rock salt, it occurs interstratified with other rocks of sedimentary origin. Occasionally, by the rapid evaporation of sea water, it is formed in some of the lagoons of the lower coast. Commercially valuable beds have been encountered by boring at Colorado in Mitchell county, at Grand Saline in Van Zandt county, west of Palestine in Anderson county, and at Dayton in Liberty county. In the

¹ The "Llano country" is the region lying along the Llano river, a tributary of the Colorado, and should not be confused with the Llano Estacado or Staked plains.

² The only continuously successful silver mine in Texas is at Shafter, Presidio county, forty-seven miles south from Marfa. It has been in active operation for fifteen or sixteen years and is credited with nearly \$7,000,000 worth of silver. — William B. Phillips, The University of Texas, Mineral Survey, Bulletin No. 5, p. 104.

three localities first mentioned salt is manufactured by the evaporation of a brine secured by the introduction of water into wells penetrating the layers or strata of rock salt.

85. Sulphur. Large deposits of sulphur have been discovered at several points in the Delaware creek region, which is situated in the northeast part of El Paso county, but on account of their remoteness they have not yet been commercially developed. Sulphur has also been encountered in most of the oil wells of the Coastal region. A fine deposit is said to have been penetrated in drilling for oil at Damon Mound in Brazoria county.

86. Gypsum, Lime, and Cement Rocks. — There are large and valuable deposits of gypsum in the state, especially in the Permian area of the Central basin region. At present this mineral is commercially utilized at Acme, near Quanah, in Hardeman county. Here there are two plants actively engaged in the manufacture of plaster.¹

Lime is produced by the burning or calcining of limestone. Rocks adapted to this purpose are found chiefly in the Cretaceous system. The lime from the kilns at McNeil ("Austin white lime") is well known for its excellent quality.

Cements of value are manufactured from limestones and clays. At times clayey limestones are found which, when burned, will produce a cement, but more frequently it is necessary to mix the ingredients artificially. The former product is hydraulic cement, the latter, Portland cement. Both possess the property of hardening beneath water and are therefore of great service in masonry construction. Materials suitable for the manufacture of cement are found

¹ Plaster of Paris is gypsum from which the water held in chemical combination has been expelled.

in a number of places, but its production in quantity seems to be confined to the works established at San Antonio and Dallas.

87. Clay. Clays of economic value abound in Texas. Along the Gulf coast they appear in the deposits of the Neocene age; farther inland they occur with the deposits of the Eocene age and are often associated with beds of lignite; still farther inland they are interstratified with rocks of the Cretaceous, Carboniferous, and Permian ages. As alluvial deposits they are found along the rivers and, though impure, they serve a variety of useful purposes.

At the present time the clays of the state are chiefly used in the manufacture of bricks, and as they differ widely in quality there is a corresponding difference in the manufactured product. At Austin a light cream-colored or "Milwaukee" brick is burned from the alluvial deposits of the Colorado river; at Elgin in Bastrop county a beautiful red brick is manufactured from clay of the Eocene system; at several points on the line of the Texas and Pacific Railway, in Palo Pinto county, and at Thurber in Erath county, red bricks for the Fort Worth and Dallas markets are burned from Carboniferous clays, and at El Paso and Laredo brickmaking materials are furnished by the deposits of the Rio Grande. In very many localities good bricks are made, but oftentimes they are mottled or "off color," due to the presence of iron in the clay. This is especially true of the East Texas product, yet by a careful selection of materials these defects could in a great measure be remedied.

Clays suitable for the manufacture of tile, drain and sewer pipe, terra cotta, and various forms of pottery, such as flowerpots, jugs, and other forms of earthenware, are

also found in the state. Establishments for the utilization of these clays are in active operation at Athens in Henderson county, Henderson in Rusk county, McDade in Bastrop county, Marshall in Harrison county, Saspameco in Wilson county, Elmendorf in Bexar county, Denton in Denton county, Tyler in Smith county, Winnsboro in Wood county, and many other places.

Clay suitable for the manufacture of fire brick and other refractory articles occurs in a number of localities. The fire brick from Henderson county have stood excellent tests both in the iron furnace at Rusk and in lime kilns.

88. Building and Ornamental Stones. There are excellent granites in Burnet, Llano, Mason, and Gillespie counties. The pink granite from the Granite mountain quarries near Marble Falls in Burnet county is a beautiful stone and, although somewhat coarse, takes a good polish. Rough dressed it has been used in the construction of the State Capitol at Austin and in many smaller structures in different parts of the state. In the form of large blocks it has been employed in building the jetties and the riprap in front of the sea wall at Galveston. A gray granite from near Llano is used for monumental and other purposes. The granites from the Trans-Pecos region are also of a gray color, both light and dark, but as yet they have not been utilized.

Among the limestones those of the Cretaceous system are most extensively used. Near Austin there are several horizons which furnish valuable building material. These rocks are soft and light colored, but harden upon exposure and often lose their brightness. Cretaceous limestones have also been used in the northern part of the state, as at

Decatur in Wise county. The Carboniferous and Permian systems likewise furnish good limestones. Carboniferous limestones have been used for buildings in Albany, Palo Pinto, Baird, and elsewhere, and Permian limestones at Ballinger, Seymour, and other places. A blue Carboniferous



FIG. 79. ONE OF THE QUARRIES AT GRANITE MOUNTAIN,
BURNET COUNTY

From this outcrop of granite was taken the stone used in building the State Capitol at Austin, and in constructing the jetties, and later the riprap on the exposed side of the new sea wall at Galveston

limestone from Santo in Palo Pinto county has been used for paving at Dallas.

Of the sandstones found within the state, the most beautiful is that quarried near Barstow in Ward county. It is of a red color, an even texture, and is easily worked. In the eastern part of the Central basin, in the Carboniferous area, there is an abundance of good sandstone. In many

instances it is preferred to limestone on account of the ease with which it may be quarried and dressed. Sandstone of good quality has been quarried in Palo Pinto county, on the Texas and Pacific Railway near the Brazos river, for use in Fort Worth and Dallas, and near Mineralwells for local use ; also in Montague county for use at Bowie and Montague, and in Eastland county for use at Cisco and Ranger. Sandstones of the Permian system have been used at Wichita Falls and Henrietta with good results. Among the older rocks of Burnet county there are sandstones suitable for curbing. Nearer the coast sandstone has been quarried at Quarry station in the northern part of Washington county, and at Rockland in Tyler county. Along the Gulf border and in eastern Texas the lack of consolidation renders the rock unsuited to building purposes, but the indurated sands occurring in the vicinity of Crockett in Houston county have been to some extent utilized.

There are many stones in the state that may be classed as ornamental. They include the opal granite of Llano county, which in the polished form is remarkable for its beauty; the agates of Presidio and Brewster counties; the golden onyx from San Saba county; the serpentines of Gillespie and Llano counties; the marbles, in various colors, of Llano county and the Trans-Pecos region; the Austin marble, a fossiliferous limestone of the Cretaceous age, which takes a fine polish; and various other limestones found in different and widely separated localities.

89. Fertilizers. Materials of value as fertilizers occurring in the state are bat guano, gypsum, greensand marls and calcareous marls. Bat guano is found in caverns chiefly in the south central counties of the state. It is

quite valuable as a fertilizer, ranking second only to Peruvian guano. Gypsum abounds in the Permian area of the Central basin. When ground it is known as "land plaster," and as such is used in other states to advantage. The greensand marls of eastern Texas, it is thought, are of sufficient importance to merit attention. While not of the highest grade, there are undoubtedly lands that would be greatly benefited by them. The value of calcareous marls in agriculture is well known, and their application to clayey and sandy soils is mechanically as well as chemically advantageous. The marly layers of several Cretaceous formations seem to be well adapted to such use.

CHAPTER X

RAILROADS

90. The Pioneer Railroads. Railroad construction in Texas dates from 1852. Although the first charter for a railroad had been granted to the Texas Railroad and Navigation Company by the Congress of the Republic as early as 1836, the Buffalo Bayou, Brazos and Colorado Railway, now a part of the Galveston, Harrisburg and San Antonio Railway, was the first road actually to undertake the work of building. Beginning at Harrisburg in 1852, it reached Alleyton, near the Colorado river, opposite Columbus, eighty miles from the initial point, in 1860.

In 1853 the building of the Galveston and Red River Railroad was begun at Houston. By July, 1856, twenty-five miles had been constructed. In the meantime, however, through reorganization, its name had been changed to the Houston and Texas Central Railway. In 1860, when, on account of the disturbed condition of the country immediately preceding the Civil War, the work of construction ceased, this road had reached Millican, eighty-one miles from Houston.

The third road in the order of construction was the Galveston, Houston and Henderson, which was begun at Virginia Point, on the mainland near Galveston, in 1854. Three years later forty miles, covering the distance to Harrisburg, had been completed.

In 1856 new work was undertaken in three widely separated parts of the state. The San Antonio and Mexican Gulf Railroad beginning this year at Port Lavaca was completed to Victoria, twenty-eight miles, early in 1861. This road suffered destruction during the Civil War, but was rebuilt and is now a part of the Gulf, Western Texas and Pacific Railway (Southern Pacific).

The same year, 1856, work was begun on a branch of the Southern Pacific Railway¹ near Caddo Lake, built chiefly for the transportation of materials to be used in the construction of its main line. Later, in 1866, when all-rail connection had been established between Marshall and Shreveport, this branch was abandoned. The main line is now a part of the Texas and Pacific Railway.

The city of Houston, to secure connection with the Buffalo Bayou, Brazos and Colorado Railway at Pierce, seven miles distant, also became a railroad builder in 1856. The Houston Tap, as the new road was termed, was sold to the Houston Tap and Brazoria Railroad and now forms a part of the International and Great Northern.

The construction of the Memphis, El Paso and Pacific Railway was begun in Bowie county, near Texarkana, in February, 1857. It was the intention of the builders to bring the rails and other necessary material up the Sulphur fork of Red river by steamboats to Moore's Landing (now Sulphur Station), and in fact some of the rolling stock had already reached that destination when by an unexpected addition to the Great Raft navigation from below was completely suspended. It then became necessary to build a branch line, forty-two miles in length, to Jefferson, on Caddo Lake, to which point river steamers had free

¹ Not the present Southern Pacific Company.

access, in order to bring material needed in the construction of the main line. Five miles of this branch had been completed and seventy-five miles of the main line made ready for the rails at the outbreak of the Civil War. This was the initial work on the line of the present Texas and Pacific Railway.

The Washington County Railroad originated in the desire on the part of the farmers of one of the richest agricultural regions of the state for a wider market, such as would be afforded by direct connection with the seaport of Galveston. To that end work was begun on this railroad also in February, 1857. In 1860 twenty-five miles, between Hempstead, on the Houston and Texas Central, and Brenham, were completed. This road was absorbed by the Houston and Texas Central, becoming a part of the Austin branch.

Under the charter name of Sabine and Galveston Bay Railroad and Lumber Company work was begun at Houston, in 1858, upon a line to the Sabine river to connect with a road from Berwick's Bay, Louisiana, and ultimately to form part of an all-rail route to New Orleans. The following year its name was changed to Texas and New Orleans Railroad. By 1861 it had reached the Sabine at the town of Orange.

These roads, together with the Indianola Railroad, chartered in 1858 and, after grading a few miles, merged, in 1860, with the San Antonio and Mexican Gulf Railway, were the pioneer railroads of Texas.

91. Railroad Construction during and since the Civil War. In 1860 there were three hundred and seven miles of railroad in actual operation in the state. Although one hundred and forty-four miles were added during the years

1861 and 1862, the period of the great Civil War was not conducive to railroad building, and in 1863 and 1864 there was no construction whatever. The years immediately following the war up to 1869 were years of financial depression in the South, and the total increase in Texas railroads amounted to only sixty-two miles. That year, however, seventy additional miles were put into operation. The smallest addition to the mileage of the state since 1868, which, like the years 1863 and 1864, witnessed no construction, was in 1875 thirty-five miles. The years of greatest activity in railroad building, on the other hand, were 1881, sixteen hundred and sixty-nine miles, and 1882, ten hundred and ninety-six miles.

The total mileage of the state for the year ending June 30, 1904, is 11,502.95, exclusive of about one hundred miles of logging or tram roads, not recognized by the State Railroad Commission as common carriers, and the interurban electric lines between Fort Worth and Dallas and between Denison and Sherman, aggregating forty-two miles.¹

92. Railroad Systems. Although all railroads now operating in Texas are obliged by law to organize as separate and distinct lines and to maintain general offices in the state, most of them fall within one of the seven dominating "systems" here given, namely, the Southern Pacific, the Gould, the Santa Fé, the "Katy," the Denver, the Rock Island, and the "Frisco."

Southern Pacific System. 1. Galveston, Harrisburg and San Antonio Railway. Houston to the Rio Grande bridge via Richmond, Eagle Lake, Columbus, Weimar, Schulenburg, Waelder, Luling, Seguin, San Antonio, Uvalde, Delrio, San Elizario, Ysleta, and El

¹ On the authority of R. A. Thompson, C.E., chief engineer of the Railroad Commission of Texas.

Paso; Spofford to Eagle Pass; Harwood to Gonzales; Smith Junction to La Grange; Harrisburg to Stella. Mileage,¹ 917.

2. Texas and New Orleans Railroad. Houston to Sabine river (Orange county) via Beaumont and Orange; Dallas to Sabine Pass

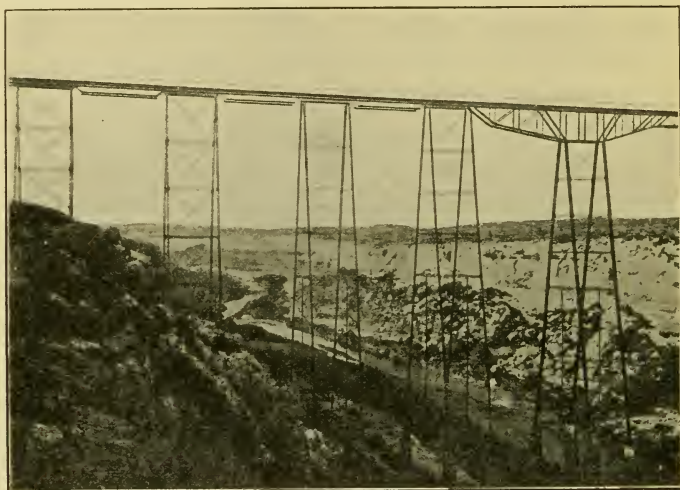


FIG. 80. A PART OF THE PECOS RIVER VIADUCT ON THE LINE OF THE GALVESTON, HARRISBURG AND SAN ANTONIO RAILWAY (SOUTHERN PACIFIC)

This structure, 2184 feet long and 321 feet high, is the highest bridge in North America and the third highest in the world. Of greater interest to the geographer is the view of the Pecos valley at this point

via Kaufman, Athens, Jacksonville, Nacogdoches, Woodville, Warren, and Beaumont. Mileage, 439.84.

3. Gulf, Western Texas and Pacific Railway. Cuero to Port Lavaca; Victoria to Beeville. Mileage, 111.20.

4. New York, Texas and Mexican Railway. Rosenberg to Victoria via Wharton and Edna; Wharton to Hawkinsville via Van Vleck; Van Vleck to Tres Palacios. Mileage, 176.72.

¹ The mileage for all railroads is that of June 30, 1904, upon the authority of the Railroad Commission of Texas.

5. Galveston, Houston and Northern Railway. Houston (Magers) to Galveston via La Porte. Mileage, 54.20.

6. Houston and Texas Central Railroad. Houston to Denison via Hempstead, Navasota, Bryan, Hearne, Calvert, Bremond, Groesbeck, Mexia, Corsicana, Ennis, Dallas, McKinney, and Sherman; Hempstead to Llano via Brenham, Giddings, Elgin, Austin, and Burnet; Bremond to Ross via Waco; Garrett to Fort Worth via Waxahachie; Fairland to Marble Falls; Burnet to Lampasas. Mileage, 690.03.

7. Houston, East and West Texas Railway. Houston to Texas-Louisiana line at Logansport via Livingston, Lufkin, Nacogdoches, and Timpson. Mileage, 190.94.

Gould System. 1. Texas and Pacific Railway. State line, Harrison county, near Waskom, to Fort Worth via Marshall, Longview, Mineola, Terrell, and Dallas; Texarkana to Fort Worth via Clarksville, Paris, Honey Grove, Bonham, Sherman, and Whitesboro; Texarkana to Marshall via Atlanta and Jefferson; Fort Worth to Sierra Blanca, El Paso county, via Weatherford, Cisco, Abilene, and Colorado. This road enters El Paso over the track of the Galveston, Harrisburg and San Antonio Railway, 1038.16 miles; Denison and Pacific Suburban Railway, 7.63 miles; Weatherford, Mineral Wells and Northwestern Railway, 23 miles. Total mileage, 1068.79.

2. International and Great Northern Railroad. Longview Junction to Laredo via Palestine, Hearne, Rockdale, Taylor, Austin, and San Antonio; Palestine to Houston via Crockett and Conroe; Troup to Mineola via Tyler; Overton to Henderson; Phelps to Huntsville; Round Rock to Georgetown; Houston to Columbia; Spring to Fort Worth (Houston and Fort Worth Line) via Navasota, Bryan, Marlin, and Waco; Valley to Calvert. Mileage, 1081.10.

3. Saint Louis Southwestern Railway of Texas. Texarkana to Gatesville via Mount Pleasant, Pittsburg, Gilmer, Tyler, Athens, Corsicana, Hubbard City, and Waco; Mount Pleasant to Sherman via Sulphur Springs, Commerce, Wolfe City and Whitewright; Commerce to Fort Worth via Greenville, Wylie, and Plano; Corsicana to Hillsboro; Tyler to Angelina river via Jacksonville and Lufkin; Noel to Dallas. Total mileage, 678.93.

4. Galveston, Houston and Henderson Railroad. Houston to Galveston. Total mileage, 46.06.

Santa Fé System. 1. Gulf, Colorado and Santa Fé Railway. Galveston to Red river (Cooke county) via Alvin, Rosenberg, Sealy, Bellville, Brenham, Somerville, Caldwell, Cameron, Rogers, Temple, Moody, McGregor, Clifton, Cleburne, Fort Worth, Sanger, and Gainesville; Cleburne to Paris via Alvarado, Dallas, Farmersville; Wolfe City and Ladonia; Somerville to Silsbee via Navasota, Conroe, and Cleveland; Temple to San Angelo via Belton, Lampasas, Goldthwaite, Brownwood, Coleman Junction, and Ballinger; Coleman Junction to Coleman; Alvin to Houston; Cleburne to Weatherford; Ladonia to Honey Grove; Bragg to Saratoga. Mileage, 1050.39.

2. Southern Kansas Railway of Texas. Texas-Oklahoma line near Higgins, Lipscomb county, to Washburn. Mileage, 115.13.

3. Pecos and Northern Texas Railway. Amarillo to Texas-New Mexico line at Texico. Mileage, 94.50.

4. Pecos River Railroad. Pecos to State Line in Reeves county. Mileage, 54.27.

5. Gulf, Beaumont and Kansas City Railway. Beaumont to Rogan. Mileage, 62.63.

6. Gulf, Beaumont and Great Northern Railway. Rogan to Center. Mileage, 77.06.

7. Cane Belt Railroad. Sealy to Matagorda. Lakeside through Donovan Plantation; Lane City to Garwood. Mileage, 102.04.

"Katy" (Missouri, Kansas, and Texas) System. 1. Missouri, Kansas and Texas Railway of Texas. Red river to Denison; Denison to Whitesboro; Fort Worth to Houston via Alvarado, Hillsboro, Waco, Temple, Taylor, Elgin, Bastrop, Smithville, La Grange, and Sealy; Denison to Mineola via Whitewright and Greenville; Greenville to Hillsboro via Rockwall, Dallas, and Waxahachie; Denton to Dallas; Whitesboro to Henrietta via Gainesville; Denison to Sherman; Trinity to Colmesneil via Groveton; Echo to Belton; Smithville to San Antonio via Lockhart, San Marcos, and New Braunfels; McKinney to Texas-Louisiana line near Waskom via Farmersville, Greenville, Sulphur Springs, Pittsburg, and Jefferson; Granger to Austin via Georgetown. Mileage, 1121.82.

2. Denison, Bonham and New Orleans Railroad. Bonham Junction to Bonham. Mileage, 24.17.

3. Dallas, Cleburne and Southwestern Railway. Egan to Cleburne. Mileage, 9.82.

4. Wichita Falls Railway. Henrietta to Wichita Falls. Mileage, 17.96.

Denver System. 1. Fort Worth and Denver City Railway. Fort Worth to Texline via Decatur, Bowie, Henrietta, Wichita Falls, Vernon, Quanah, Clarendon, Amarillo, and Dalhart. Mileage, 453.57.

2. Wichita Valley Railway. Wichita Falls to Seymour. Mileage, 51.

3. Wichita Falls and Oklahoma Railway. Wichita Falls to Byers. Mileage, 22.

Rock Island System. 1. Chicago, Rock Island and Gulf Railway, Oklahoma-Texas line via Dalhart to Texas-New Mexico line; Amarillo east to Texas-Oklahoma line near Texola; State line at Red river in Montague county to Fort Worth; Bridgeport to Graham via Jacksboro; Fort Worth to Dallas. Mileage, 384.24.

"Frisco" System. 1. Saint Louis, San Francisco and Texas Railway. Red river to Denison and track in Sherman. Mileage, 6.66.

2. Red River, Texas and Southern Railway. Sherman to Carrollton; connection (near Fort Worth) between Saint Louis Southwestern and the Fort Worth and Rio Grande. Mileage, 57.54.

3. Fort Worth and Rio Grande Railway. Fort Worth to Brady via Granbury, Stephenville, Dublin, Comanche, and Brownwood. Mileage, 195.88.

4. Paris and Great Northern Railroad. Paris to Red river. Mileage, 16.94.

5. Blackwell, Enid and Texas Railway. Vernon to the Red river. Mileage, 12.77.

6. Oklahoma City and Texas Railroad. Quanah to the Red river. Mileage, 8.68.

93. Other Railroads.

1. San Antonio and Aransas Pass Railway. San Antonio to Kerrville via Boerne; San Antonio to Corpus Christi via Floresville, Kenedy, and Beeville; Gregory to Rockport; Skidmore via Alice to Falfurrias; Kenedy to Houston via Cuero, Yoakum, Hallettsville, and Eagle Lake; Yoakum to Waco via Flatonia, Giddings, Rockdale, and Cameron; Austin Junction to Lockhart. Mileage, 723.70.

2. Texas Central Railroad. Waco to Stamford via Walnut Springs, Dublin, Cisco, and Albany. Mileage, 226.27.

3. Texas Mexican Railway. Corpus Christi to Laredo and Fort McIntosh. Mileage, 162.24.

4. Texas Midland Railroad. Paris to Commerce ; Greenville to Ennis. Mileage, 111.18.

5. Texarkana and Fort Smith Railway (Port Arthur Route). Red river to Texas-Arkansas line near Bloomburg via Texarkana ; Sabine river to Port Arthur via Beaumont. Mileage, 81.12.

6. Texas Southern Railway. East Winnsboro to Marshall via Gilmer. Mileage, 71.41.

7. Gulf and Interstate Railway. Beaumont via High Island to Bolivar. Mileage, 70.30.

8. Texas, Sabine Valley and Northwestern Railway. Longview to Carthage and Boren. Mileage, 38.80.

Marshall, Timpson and Sabine Pass Railway. Carthage to Timpson. Mileage, 19.10.

These properties are operated as one road.

9. Saint Louis, Brownsville and Mexico Railway. Robstown via Kingsville to Brownsville. Mileage, 141.10.

10. Trinity and Brazos Valley Railway. Cleburne via Hillsboro and Hubbard City to Mexia. Mileage, 77.90.

Total mileage of above railroads, 11,116.90.

Mileage of minor railroads, 386.05.

Total mileage in Texas on June 30, 1904, not including electric, interurban, and "lumber" roads, 11,502.95.

CHAPTER XI

IMPORTANT EVENTS IN TEXAS HISTORY

94. Early Attempts at Settlement. The earliest settlement within the present boundaries of Texas was made by the Spanish at Ysleta on the Rio Grande in 1682. In 1685 a French expedition under La Salle, searching for the mouth of the Mississippi, entered Matagorda bay. Landing here, its commander took possession of the country in the name of the king of France and established Fort Saint Louis on Lavaca river. A few years later the post was destroyed by the Indians. In the meantime the Spanish, hearing of the French settlement, sent a series of expeditions under Ponce de León to discover its whereabouts, the third of which was successful. He found the bleaching bones of some of the colonists. The object of a fourth under the same leader was to establish a mission among the Tejas Indians. This was accomplished in 1690, but the Indians were troublesome, and in 1693 the Spanish were forced to give up the mission and retreat.

95. French and Spanish Claims. The Missions. The French, however, who were becoming more firmly established on the Mississippi, still claimed the region as far west as Matagorda bay by virtue of La Salle's settlement. In 1713 they organized an expedition under Saint-Denis for the purpose of opening up trade relations with the Spanish. That daring young officer, after numerous

delays, finally succeeded in crossing the "vast wilderness" of Texas and presented his passport at the *presidio* of Captain Diego Ramón beyond the Rio Grande. His presence here was sufficient to arouse the Spanish to the necessity of holding the country. They accordingly organized a counter expedition, composed of priests and soldiers, for the purpose of establishing missions and Christianizing the Indians. In this expedition, strange as it may seem, Saint-Denis (1715) accepted the position of chief guide. The missions were successfully established, and thus the Spanish secured title to Texas. In 1721 Sieur de Bienville, the commandant of Louisiana, fitted out an expedition to make good the claim of France. It reached Fort Saint Louis, but on account of the hostility of the Indians soon returned to New Orleans. The rivalry of the French and the Spanish and the incursions of the Indians hindered both the settlement of the country and its civilization. Though the settlers and garrison at San Antonio had defeated their Indian enemies in a desperate battle (1732), it was still dangerous to venture far from the post, and twenty-five years later the inmates of the San Saba Mission were massacred to a man. In 1762 King Louis XV of France transferred to the king of Spain all of Louisiana west of the Mississippi. This settled for a time the dispute over the Texas-Louisiana boundary, which had been the cause of much bitterness between the Spanish and the French. In 1794 the missions were secularized. Though the pomp and ceremony of the church had disappeared, they were still to serve as strongholds in the later struggles.

96. Spanish Rule and the Anglo-American. In 1800 Spain returned Louisiana to France. Now transpired an

event of the greatest importance—the coming of the Anglo-American, a few adventurous spirits at first and then a body of actual settlers who were destined soon to possess themselves not only of the land but of the government as well. This year Philip Nolan, having obtained permission of De Nava, the Spanish commandant of Texas, entered the province for the purpose of capturing wild horses. Suspected of harboring some other design, orders were sent for his arrest. These the Spanish captain at Nacogdoches attempted to enforce, and in the attack Nolan and one of his men were killed. The remainder of his party surrendered.

97. The Louisiana-Texas Boundary. Magee's Invasion. The sale of Louisiana to the United States in 1803 reopened the old question concerning the Texas-Louisiana boundary and for a time war seemed probable, but it was finally agreed that until further arrangements could be made the strip of land, about thirty miles wide, between the Sabine river and the Arroyo Hondo should be neutral ground, that is, should be occupied by neither the Spanish nor the Americans. It immediately became the resort of robbers and desperadoes. In the meantime the Mexicans themselves were becoming restive under the Spanish rule, and although their uprisings were for a time put down, they nevertheless afforded the Anglo-American a pretext for the invasion of Texas. In 1812 Augustus Magee, formerly a lieutenant in the United States army, and Colonel Bernardo Gutierrez (*gōō-tē-er'es*), a Spanish refugee from Mexico, raised an army in the neutral ground. Their object was to assist Mexico in throwing off the Spanish yoke. At first they were very successful. Nacogdoches and La Bahía (Goliad) were soon in their possession.

The Spanish army sent against them was defeated at Rosillo creek, near San Antonio, March 28, 1813, and the victors marched to the Alamo (San Antonio). In June they defeated another Spanish army, but finally, on August 18, they were utterly crushed by the third Spanish army (battle of the Medina).

98. Lafitte. In 1816 Galveston island was for a short time the seat of a "republic" having for its chief business privateering. Shortly thereafter, during the absence of the "republicans," the island was seized by Jean Lafitte, who established there his "kingdom." Not only were Spanish ships captured, but slaves were landed and smuggled into Louisiana to be sold. Lafitte finally left the island, after destroying his fort, upon the order of the United States government.

99. Long's Invasion. In 1819 the Sabine river was fixed by treaty as the boundary between those parts of Texas and Louisiana adjacent to the Gulf. This year another party of Anglo-Americans, organized at Natchez, Mississippi, under James Long, invaded the province for the purpose of establishing a republic. Nacogdoches became the seat of government and even a newspaper was published. The settlers were, however, soon scattered by the Spanish. Again, in 1821, Long, with a few followers, attempted to establish himself at Goliad. In this he was unsuccessful, being captured and sent to a Mexican prison.

100. Austin's Colony. In January, 1821, Moses Austin had been granted permission, through the influence of Baron de Bastrop, to establish a colony in Texas, but dying in June, the conduct of this enterprise fell to his son, Stephen F. Austin. In the meantime (August) the

Mexicans had succeeded in throwing off the Spanish yoke and had established an independent government. Austin's first colonists reached the Brazos late in the year (December) and there began their settlement. In 1823 a town was built called San Felipe (*fā-lē'pā*)¹ de Austin, which became the capital of Austin's colony. In 1824 Texas and Coahuila became a single state of the new Mexican republic. Under the grants made by the congress of this state immigration continued, thus increasing the Anglo-American population. The Mexicans soon began to view this movement as a source of danger, never having been entirely free from suspicion since the early boundary disputes. This suspicion was further increased by the knowledge that the United States desired to purchase Texas.

101. Mexican Irritation. In 1829 President Guerrero, who was then exercising dictatorial power, issued a decree abolishing slavery in the Mexican republic, but Texas was exempted from its operation. In 1830 Bustamante (*boos-tä-män'tā*) became president of the republic. His government was unfavorable to Anglo-American immigration, forbade further introduction of slaves into Texas, and cut off the privilege of importing goods free of duty which the colonists had hitherto enjoyed. This the settlers considered not only burdensome but unjust. The revolution of 1832, headed by Santa Anna, followed. The colonists now held two conventions at San Felipe de Austin, one in the fall of 1832, the other in the spring of 1833, to discuss the situation, and it was finally decided to petition the Mexican government for a repeal of the former decrees and a separation from Coahuila. The petition was presented by Austin. Becoming impatient at the numerous

¹ Pronounced *Fil'ē-pē* in Texas.

delays, he wrote to the authorities at San Antonio recommending the formation of a separate state. In the meantime the petition was passed upon, and, while much remained ungranted, Santa Anna promised the repeal of the law against colonization. News of Austin's letter, however, caused his arrest, and it was not until 1835 that he was allowed to return to his settlement. Santa Anna had now become dictator and, although hostile bands of Indians still roamed over the country, his congress ordered the disarming of the Texans. General Cos was sent to enforce this decree. This spark fired the revolution which set Texas free.

102. The Texas Revolution. An attempt on the part of the Mexicans to seize a cannon at Gonzales met with resistance (October 2, 1835). A few days later Goliad was captured by the Texans. On October 10 Austin reached Gonzales and was elected commander of the rapidly gathering army. General Cos had now reached San Antonio. On October 28 occurred the battle of Concepción (*cōn-sep-sē-ōn'*), in which the Texans were victorious (see San Antonio). Though they were still loyal to the Mexican constitution of 1824, a general consultation of the Texans began its session at San Felipe de Austin on November 3 and a provisional government was formed. Austin having been appointed one of the commissioners to the United States, the command of the army now fell upon General Edward Burleson. On December 9 following General Cos and his army at San Antonio surrendered. The Texans thus secured a large quantity of arms, ammunition, and stores. While the volunteer army was besieging San Antonio, Sam Houston, undoubtedly the most remarkable character in Texas history, had been

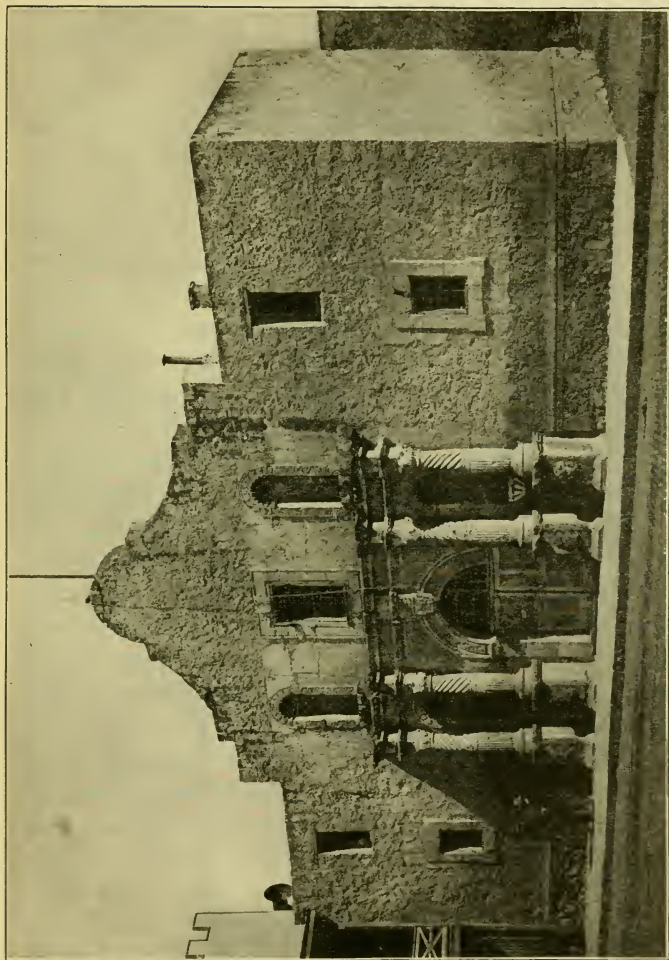


FIG. 81. THE ALAMO, SAN ANTONIO

Copyright, 1903 and 1904, by Nic. Tengg. Used by permission

appointed commander in chief of the regular army, whose organization had been provided for by the provisional government.

103. The Alamo, Goliad, and San Jacinto. The new year, 1836, had scarcely opened when Santa Anna himself invaded Texas at the head of a large body of troops. On February 23 he appeared before San Antonio. The small garrison under Colonel William B. Travis retired to the Alamo and there prepared for defense. A summons to surrender was declined. On March 6 the Mexicans made their final assault, and the entire garrison was annihilated, fighting to the last man (see San Antonio). Colonel Fannin, in attempting to retreat from Goliad, was overtaken by the Mexicans and forced to surrender. Taken back to Goliad, his entire command was shot down in cold blood—an act unparalleled in history. This was Palm Sunday, 1836. The Mexican army now pushed on, and General Houston, who had taken command of the Texans at Gonzales, upon hearing of the defeat at the Alamo, began a hasty retreat which continued about six weeks. Finally, at San Jacinto, April 21, one division of the Mexican army was completely overwhelmed by Houston, and Santa Anna himself made prisoner.

104. The Republic of Texas. Already, on March 2, at Washington, the people of Texas had declared that all political connection with Mexico was forever ended and that they now constituted a *free, sovereign, and independent republic*, and two weeks later David G. Burnet had been elected president of the provisional government (March 16–17). On September 1, at a general election, Sam Houston was chosen president. He was inaugurated at Columbia on October 22, and Stephen F. Austin became

secretary of state. The following year the republic was recognized by the United States, and soon after by other nations.

105. The State of Texas. Still the Anglo-American colonists came, and in 1845 Texas was admitted to the United States by annexation. This aroused great indignation in Mexico and was the cause of a war between that country and the United States in which the latter was victorious. Not only was the Rio Grande established as the boundary between Texas and Mexico, but the United States secured a vast tract of land between Texas and the Pacific coast, including California. Texas grew rapidly in population and wealth until the outbreak of the Civil War. In 1861 the state withdrew from the Union and joined the Confederacy. The years following were years of hardship and sorrow. The end of the struggle found the people impoverished and disheartened. Texas was readmitted to the Union in 1870, and since 1874 has advanced with enormous strides. Wealth and prosperity have thrown their mantles about her, the population has increased with wonderful rapidity, thousands of miles of railroads have been built, and large cities and thriving towns have sprung up. Where the lonely and widely separated missions once held sway, the Anglo-American has developed a great and prosperous country. The Spanish civilization, such as it was, has passed away and the Indian is no more; a better civilization has replaced the old, and a stronger race has made the land its own.

CHAPTER XII

THE GOVERNMENT

The government of the state of Texas, like that of the other states, is divided into three distinct departments, — the *legislative*, the *executive*, and the *judicial*.

106. The Legislative Department. The legislative department consists of a senate (upper house) and a house of representatives (lower house), which together are styled “The Legislature of the State of Texas.” The legislature is the lawmaking power.

The senate is limited to thirty-one members, one half of whom (fifteen or sixteen, as the case may be) are elected every two years for a term of four years, with the exception that, following a reapportionment, a new senate is elected and the members draw by lot for the long and short terms (two and four years), after which, until the next reapportionment, they are elected one half biennially as above stated.

The members of the house of representatives are elected biennially for two years. There cannot be more than one representative for every fifteen thousand inhabitants, and the total membership of the house cannot exceed one hundred and fifty. The present number (apportionment of 1901) is one hundred and thirty-three.

The lieutenant governor is *ex officio* president of the senate, which elects from among its members a president *pro tempore* who shall preside in the absence of the

lieutenant governor. The presiding officer of the house is the speaker, who is elected by that body from its own membership.

The legislature meets every two years at such time as may be provided by law (second Tuesday in January), and at other times when convened by the governor.

107. The Executive Department. The executive department consists of a governor, who is the chief executive officer of the state, a lieutenant governor, a secretary of state, a comptroller of public accounts, a treasurer, a commissioner of the general land office, and an attorney-general, — officers provided for by the constitution. They are elected for a term of two years, with the exception of the secretary of state, who is appointed by the governor. In addition to the above, a state superintendent of public instruction, elected for a term of two years, a commissioner of agriculture, insurance, statistics and history, appointed for the same term by the governor, and three railroad commissioners, one of whom is elected every two years for a term of six years, are provided for by statute, as are also the state health officer, the state revenue agent, and the various administrative boards.

108. The Judicial Department. The judicial department consists of the following courts: (1) The supreme court, with three judges, one of whom is elected every two years for a term of six years. (2) The court of criminal appeals, with three judges elected in the same manner. This court holds three terms during the year, — one at Tyler, one at Dallas, and one at Austin. (3) The courts of civil appeals, five in number. Each of these courts has three judges who are elected as in the preceding cases. (4) District courts, of which there are sixty-three in the state. A district judge

is elected for the term of four years. (5) County courts (one in each organized county), whose presiding officers, county judges, are elected for the term of two years. (6) Commissioners' courts (one in each organized county), whose presiding officers are the county judges. The other members of these courts are four commissioners elected for the term of two years. (7) Justices' courts, of which there is one in each of the precincts (not less than four nor more than eight) into which the county is divided. The presiding officers are justices of the peace. They are elected biennially and hold their office two years.

Vacancies in the offices of judges of the supreme court, the court of criminal appeals, the court of civil appeals, and the district courts are filled by appointments made by the governor until the next general election; vacancies in the office of county judges and justices of the peace are filled by appointments made by the commissioners' court until the next general election for such offices. (See the Constitution of the State of Texas.)

Reference: *The Government of the People of the State of Texas*, by George Pierce Garrison. Philadelphia: Eldredge and Brother, 1900.

109. Presidents of the Republic of Texas.

David G. Burnet, president *ad interim*, March 16 or 17,¹ 1836–October 22, 1836.

Sam Houston, October 22, 1836–December 10, 1838.

Mirabeau B. Lamar, December 10, 1838–December 13, 1841.

Sam Houston, December 13, 1841–December 9, 1844.²

Anson Jones, December 9, 1844–February 16, 1846.

¹ Existing records are not clear as to this date.

² General Houston afterwards represented Texas in the United States Senate, and later was elected governor of the state.

110. Governors of the State of Texas.

J. Pinckney Henderson	1846-1847
George T. Wood	1847-1849
P. Hansborough Bell	1849-1853
Elisha M. Pease	1853-1857
Hardin R. Runnels	1857-1859
Sam Houston	1859-1861
Edward Clark	1861 (March to November)
Frank R. Lubbock	1861-1863
Pendleton Murrah	1863-1865
A. J. Hamilton	1865-1866 (appointed)
James W. Throckmorton . .	1866-1867
Elisha M. Pease	1867-1869 (appointed)
Edmund J. Davis	1870-1874
Richard Coke	1874-1876
Richard B. Hubbard	1876-1879
Oran M. Roberts	1879-1883
John Ireland	1883-1887
Lawrence S. Ross	1887-1891
James S. Hogg	1891-1895
Charles A. Culberson	1895-1899
Joseph D. Sayers	1899-1903
S. W. T. Lanham	1903-

CHAPTER XIII

EDUCATION

111. The Public Schools. The public schools of Texas have, during the last ten years, made great progress, due largely to the influence of Sam Houston Normal Institute and The University of Texas in furnishing trained and competent teachers. The cities and larger towns have all organized graded schools, and there are now (1905) within the state over one hundred public high schools affiliated with the university—schools which fulfill the entrance requirements in certain specified branches, such as English, history, mathematics, ancient and modern languages, etc.

112. The Permanent School Fund. The permanent school fund for the year ending August 31, 1904, was as follows: ¹

Cash	\$158,851.06
Bonds, state	2,231,500.00
Bonds, county	7,311,519.00
Bonds, city and independent school district	868,887.55
Bonds, railroad	1,603,317.00
Land notes	20,104,840.05
	<hr/> \$32,278,914.66

113. The Perpetual School Fund. According to the constitution, all funds, lands, and other property set apart for the support of the public schools shall constitute a

¹ Compiled from the Report of the State Treasurer.

perpetual school fund. For the year ending August 31, 1904, the condition of this fund may be stated as follows:

Permanent school fund	\$32,278,914.66
8,889,482 acres of land at \$1 per acre	8,889,482.00
	<u>\$41,168,396.66</u>

114. The Available School Fund. This fund consists of the income of the permanent school fund (interest on bonds and land notes), one fourth of all occupation taxes, a one-dollar poll tax, and a state tax of eighteen cents on the hundred dollars. The available school fund for the year ending August 31, 1904, amounted to \$3,855,225.40.

Cities and towns may have control of the public schools within their limits and may levy a special tax, not exceeding one half of one per cent, for their additional support. In consequence of this provision of the law, for the year mentioned, \$1,324,793.09 was realized from local taxation. These funds were also supplemented by the tuition received from pupils under and over the lawful school age, which amounted to \$68,204.45.

115. Sam Houston Normal Institute. This school for the training of teachers was established at Huntsville in 1879 largely through the efforts of Dr. Barnas Sears, at that time the agent of the Peabody Educational Fund. In this work he was warmly supported by Governor O. M. Roberts and Dr. R. C. Burleson. The institute stands as a memorial to General Sam Houston. It is well equipped with buildings and apparatus, and has been the recipient of aid from the Peabody Fund and of legislative appropriation. It has furnished the state with a large number of teachers and has done much to advance the cause of education.



FIG. 82. SAM HOUSTON NORMAL INSTITUTE, MAIN BUILDING,
HUNTSVILLE

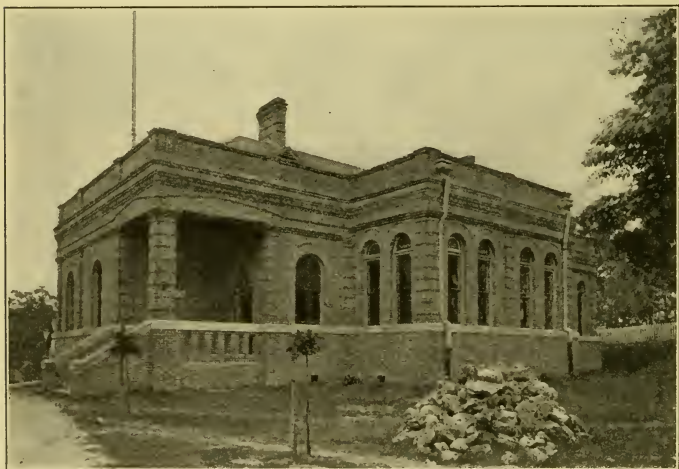


FIG. 83. SAM HOUSTON NORMAL INSTITUTE, PEABODY LIBRARY
BUILDING

During the first twenty years of its existence the names of nearly five thousand different pupils were borne on its rolls.

116. North Texas State Normal College. The second normal school in the state was established at Denton under an act of the twenty-sixth legislature approved March 31, 1899. It opened its doors to students on September 18, 1901, and has already a large attendance.



FIG. 84. NORTH TEXAS STATE NORMAL COLLEGE, DENTON

One building and the grounds were the gift of the people of Denton.

117. Southwest Texas Normal School. The third normal school in the state was created by an act of the twenty-sixth Legislature approved May 10, 1899. It is located at San Marcos, a thriving town on the International and Great Northern and the Missouri, Kansas and Texas railroads, thirty-one miles southwest of Austin. The citizens of the town donated a commanding site "containing about eleven acres, and known as Chautauqua Hill," upon which a suitable building has been erected at a cost of \$25,000 (act of the twenty-seventh legislature approved March 28, 1901). The first annual session opened September 9, 1903.

118. Prairie View State Normal and Industrial College. This institution, located near Hempstead in Waller county, has for its main object the education of colored teachers. It was established in 1876 by an act of the fifteenth legislature and is under the management of the board of directors of the Agricultural and Mechanical College.

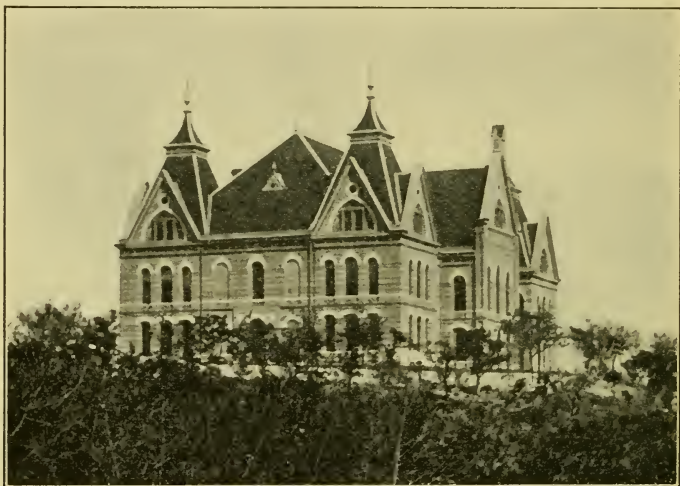


FIG. 85. SOUTHWEST TEXAS STATE NORMAL SCHOOL, SAN MARCOS

119. The College of Industrial Arts for Young Women¹ was established by an act of the twenty-seventh legislature. The commission appointed to locate the institution selected a tract of seventy acres in the northeast part of Denton, which was donated by the citizens of that town together with \$16,050. The central portion of an excellent building has been erected, in which the school was opened September 23, 1903. "An artesian well six hundred feet deep, just in the rear of the building, gives a

¹ Formerly the Girls Industrial College.

bounteous supply of the purest water." By legislative enactment, the Board of Regents are given the necessary powers to establish and maintain a first-class industrial institute and college for the education of white girls in this state in the arts and sciences. The general object of this institution is to fit and prepare such girls for "the practical industries of the age."

120. The Agricultural and Mechanical College of Texas. The Agricultural and Mechanical College owes its origin



FIG. 86. COLLEGE OF INDUSTRIAL ARTS, DENTON

to an act of Congress approved July 2, 1862, providing that there should be granted to the several states "an amount of public land equal to 30,000 acres for each Senator and Representative in Congress to which the states are respectively entitled by the apportionment under the Census of 1860." It especially provides that the proceeds of the sale of this land shall constitute a perpetual fund, the interest of which shall be used for the endowment, support, and maintenance of a college where

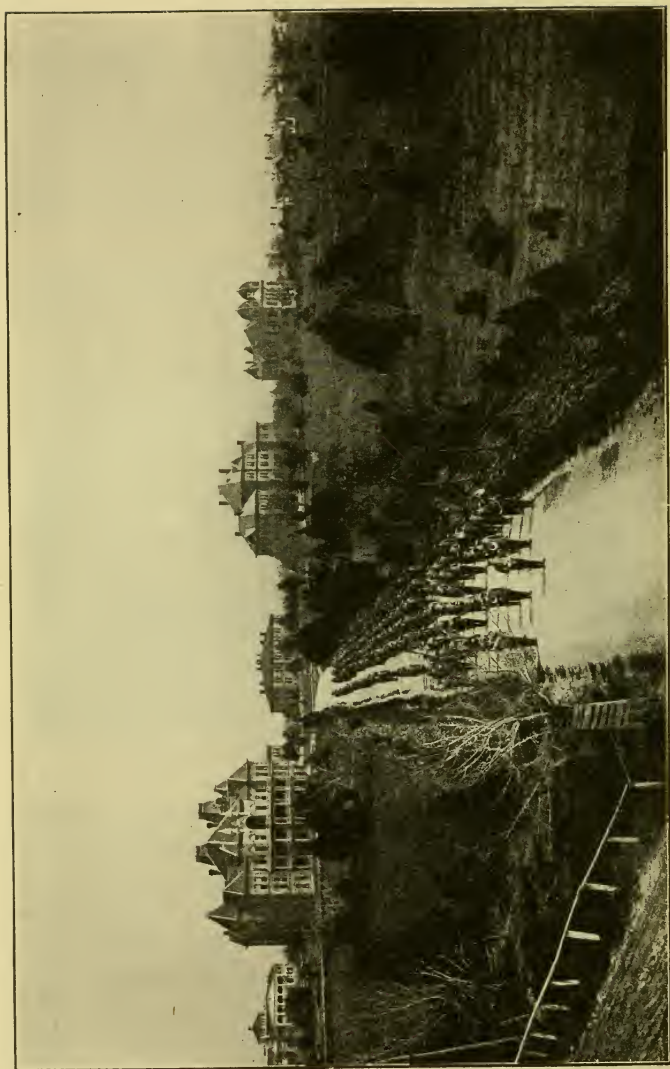


FIG. 87. VIEW OF A PART OF THE CAMPUS, AGRICULTURAL AND MECHANICAL COLLEGE

the leading studies, including military tactics, shall be those related to agriculture and the mechanic arts. November 1, 1871, the legislature of Texas accepted the trust and received from the government 180,000 acres of land, which was sold for \$174,000. The interest at the time of the opening of the college, October 4, 1876, amounted to \$35,000 additional. The institution is located on a tract

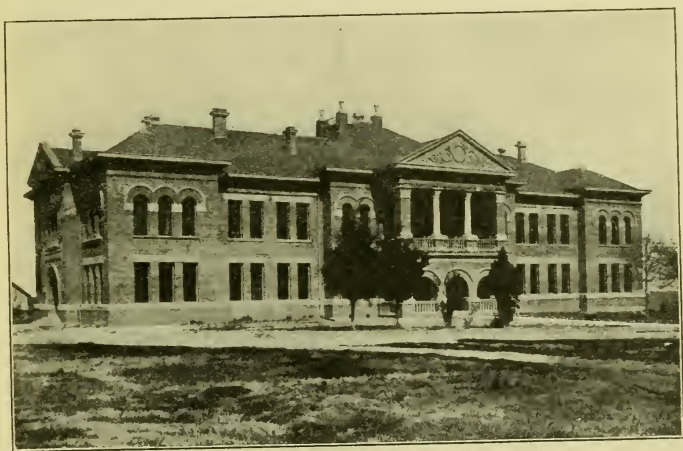


FIG. 88. AGRICULTURAL BUILDING, AGRICULTURAL AND MECHANICAL COLLEGE

of 2416 acres of land, donated by Brazos county, at College Station, on the Houston and Texas Central and International and great Northern railroads, five miles south of Bryan. The succeeding legislatures since its establishment have made liberal appropriations, and it is now excellently equipped with buildings and apparatus adapted to its special work. Although under a separate management, it is, by the constitution, a branch of The University of Texas.

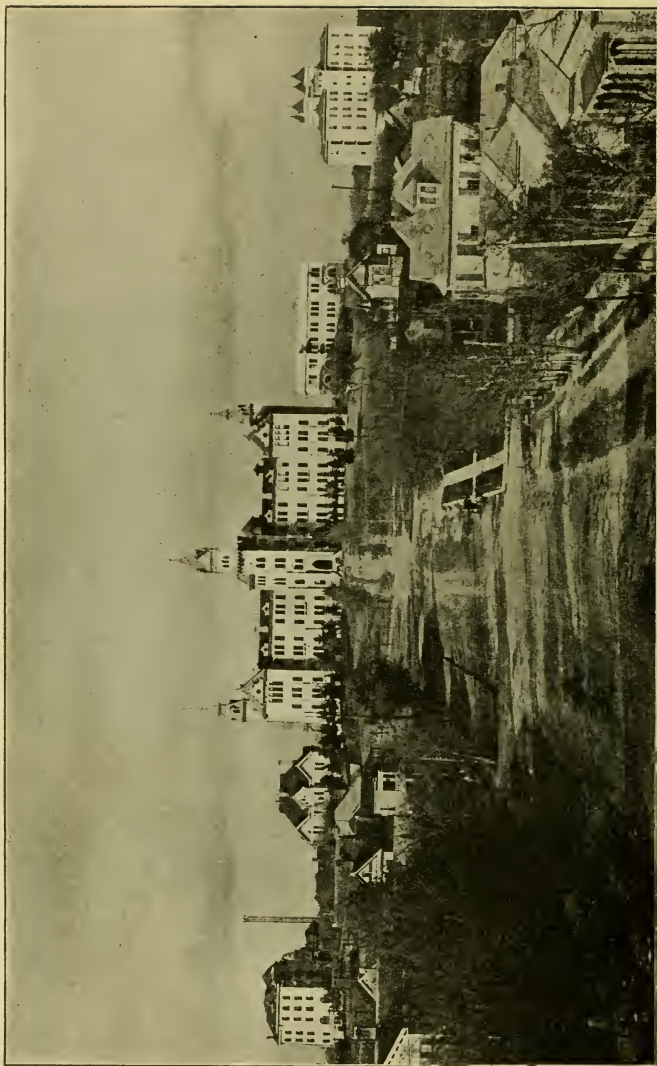


FIG. 89. THE UNIVERSITY OF TEXAS, MAIN UNIVERSITY, AUSTIN

121. **The University of Texas.** "The idea of a university for Texas is as old as Texas." In January, 1839, the Congress of the Republic gave fifty leagues of public land for its support and set apart the ground for its campus in Austin. The state legislature in 1858 added \$100,000 in United States bonds and one section of land out of every ten reserved for the use of the state. During the



FIG. 90. THE UNIVERSITY OF TEXAS, MEDICAL DEPARTMENT,
GALVESTON

Civil War much of the university endowment was turned into the general revenue and used to meet the necessities of the state. The amounts then taken have since, in part, been refunded. The legislature in 1881, under the authority of the Constitution of 1876, provided for its organization and maintenance and created a Board of Regents to which was intrusted its management. By a

popular vote, in September, 1881, the Main University, consisting of the departments of Literature, Science and Arts, and of Law, to which the departments of Engineering and Education have since been added, was located at Austin and the Medical Department at Galveston. The Main University was formally opened for the reception of students in September, 1883; the Medical Department in October, 1891.

122. The University Endowment. The Constitution of 1876 took away the lands previously granted, except the fifty leagues given in 1839, and substituted for them 1,000,000 acres farther west. The legislature in 1883 set apart an additional 1,000,000 acres. Most of these lands are leased. The permanent fund, including bonds, land-notes and land, amounts to \$2,315,768.67.¹ The available fund (receipts from leases, interest, fees, etc.) for the year ending August 31, 1904, was \$117,351.76. Like other state institutions, the university is also the recipient of legislative grants. Its buildings and equipment are among the best in the South, and its high standing is everywhere recognized.

123. Denominational Colleges. Here as elsewhere in this country, the church has taken an active part in the educational development of the state. For many years the colleges established by the different religious bodies were the only representatives of the higher education. Some of these institutions began in the days of the republic; others are of a later growth; yet all have been established with a view to the general welfare of the state, — the training of intelligent, honest, and patriotic citizens. While some of the early institutions have ceased to exist and others

¹ From Report of State Treasurer for the year ending August 31, 1904, p. 28.

have been consolidated, the denominational colleges are to-day better equipped and stronger than ever before.

Baylor University (Baptist), the pioneer Texas college, was chartered by the republic on February 13, 1845. It was first located at Independence, Washington county. In 1886 it was consolidated with Waco University (chartered in 1861) and removed to its present location at Waco.

Baylor Female College (Baptist) was also chartered in 1845. In 1885 it was removed from Independence to Belton.

Austin College (Presbyterian) was chartered April 5, 1850. It was first located at Huntsville and later removed to Sherman.

Southwestern University (Methodist) was opened at Georgetown on October 6, 1873. It is the successor of several of the early institutions, — Ruttersville, McKenzie, Wesleyan, and Soulé colleges.

Of the other colleges of the state, mention should be made of the following: the Texas Christian University, formerly Add-Ran University (Christian), Waco; Fort Worth University (Methodist), Fort Worth; Carr-Burdette Christian College (Christian), Sherman; Trinity University (Cumberland Presbyterian), Waxahachie; Coronal Institute (Methodist), San Marcos; Saint Edward's College (founded and conducted by members of the Congregation of the Holy Cross, Roman Catholic), Austin; Daniel Baker College (Presbyterian), Brownwood; Howard Payne College (Baptist), Brownwood; Simmons College (Baptist), Abilene; Blinn Memorial College (German Methodist), Brenham.

124. Libraries. Among the institutions of an educational value not directly connected with a teaching or

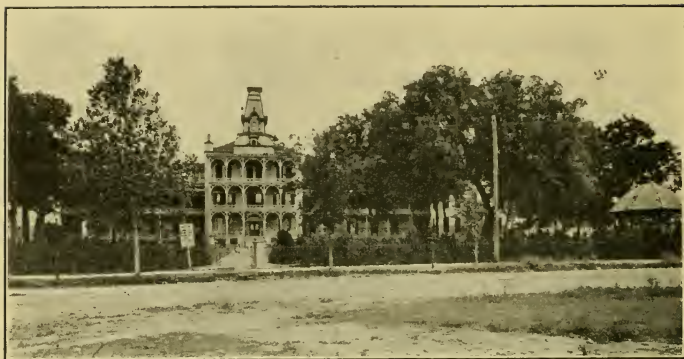


FIG. 91. A PARTIAL VIEW OF THE STATE INSTITUTION FOR THE
BLIND, AUSTIN

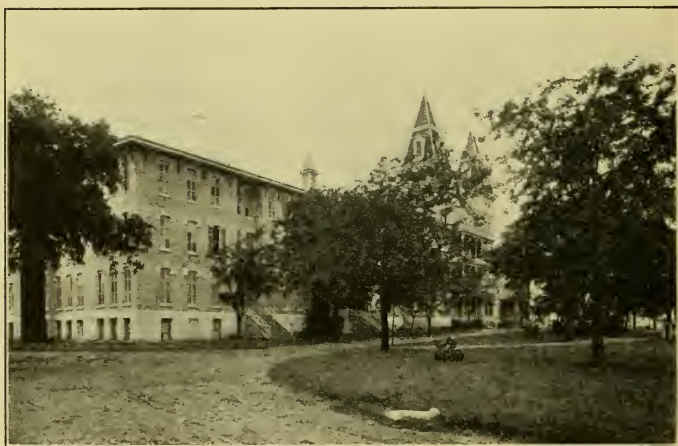


FIG. 92. DEAF AND DUMB ASYLUM (TEXAS SCHOOL FOR THE DEAF),
AUSTIN

professional body, the public library plays an important part. Through the munificence of Andrew Carnegie, who, upon the fulfillment of certain conditions, donated the necessary buildings, public libraries have been established



FIG. 93. STATE INSANE ASYLUM, AUSTIN

in the following places: Belton, Brownwood, Bryan, Clarksville, Cleburne, Dallas, El Paso, Fort Worth, Greenville, Houston, Pittsburg, San Antonio, Santa Anna, Temple,



FIG. 94. SOUTHWESTERN INSANE ASYLUM, SAN ANTONIO

Terrell, Tyler, and Waco. There are also public libraries at Galveston and Waxahachie.

The State Library and the Library of the Supreme Court are provided with quarters in the State Capitol at

Austin. The library of The University of Texas, which is the largest and most complete in the state, is also located in Austin.

125. Eleemosynary Institutions. The eleemosynary institutions of the state include both schools and hospitals. The Institution for the Blind, the Deaf and Dumb Asylum (Texas School for the Deaf), and the Institute for the Deaf, Dumb, and Blind Colored Youths are located at Austin. The State Orphan Home is at Corsicana. All of these institutions are educational, wholly or in part. The following are hospitals: the State Insane Asylum at Austin, the North Texas Hospital for the Insane at Terrell, the Southwestern Insane Asylum at San Antonio, the Epileptic Colony at Abilene. The Confederate Home at Austin is both a home and a hospital for needy ex-Confederate soldiers.

126. Penal Institutions. There are three penal institutions in the state: the house of correction and reformatory at Gatesville, the penitentiary at Huntsville, and the penitentiary at Rusk. At the last named the manufacture of iron water pipe is an industry of some importance. On July 1, 1904, the prison population amounted to 4036.

CHAPTER XIV

POPULATION

127. Population. The population of Texas according to the Eleventh Census was 2,235,527. In 1900, according to the Twelfth Census, it had reached 3,048,710, an increase of 813,183, or 36.4 per cent, in ten years.

If the states be arranged in the order of their populations, it will be seen that Texas now occupies the *sixth* place; that in 1890 it occupied the *seventh* place; in 1880, the *eleventh*; in 1870, the *nineteenth*; in 1860, the *twenty-third*; and in 1850, the *twenty-fifth*.

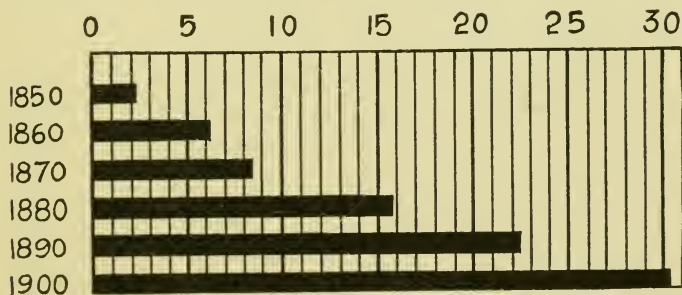


FIG. 95. DIAGRAMMATIC ILLUSTRATION OF THE INCREASE OF POPULATION IN THE STATE, 1850-1900

The increase in population during each successive decade is shown by the comparison of the lengths of the black horizontal lines in the preceding diagram, the vertical divisions of which represent hundreds of thousands.

128. Elements of Population. The elements of population in the state are three,—the native white, the colored, and the foreign white. Their numerical strength is as follows:

Native white	2,249,088
Colored (including Negroes, Chinese, Japanese, and Indians) . . .	622,041
Foreign white	177,581
Total	<u>3,048,710</u>

129. Native White Population. Of the native white population (amounting to 2,249,088), 1,514,262 were born in Texas. The remainder, 734,826, are, of course, natives of other states and territories. The twelve states making the largest contributions are:

Tennessee	121,573	Kentucky	43,995
Alabama	111,298	Louisiana	33,565
Mississippi	80,021	Illinois	24,995
Arkansas	69,068	North Carolina . . .	17,037
Georgia	66,213	South Carolina . . .	15,097
Missouri	49,134	Virginia.	14,673

Ohio and Indiana together furnished 21,764; New York, Pennsylvania, and New Jersey, 15,332; and Kansas, Nebraska, and Iowa, 14,416.

130. Colored Population. The colored population of the state is as follows:

Negroes	620,722
Chinese	836
Indians	470
Japanese	<u>13</u>
	622,041

The negro population constitutes 20.4 per cent of the total population of the state. Its distribution by counties is indicated on the accompanying map. Those areas having a negro population of over 5000 per county are set off

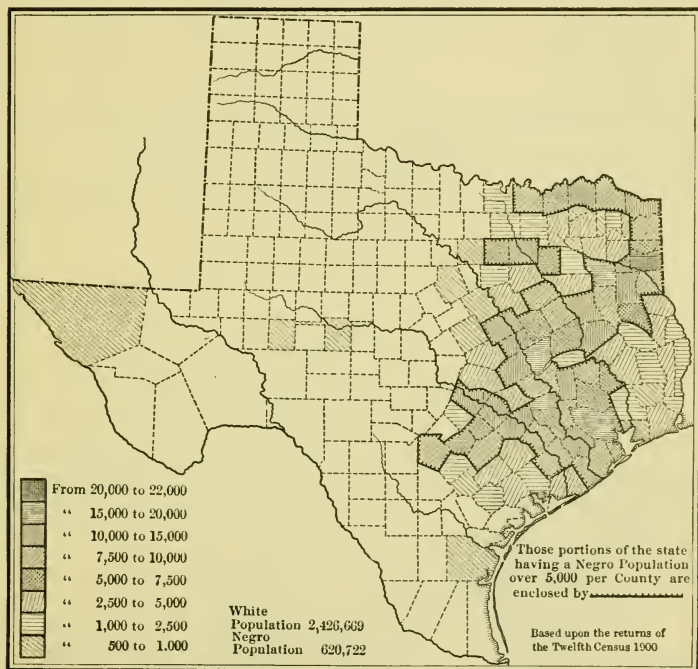


FIG. 96. MAP OF TEXAS SHOWING THE DISTRIBUTION OF THE NEGRO POPULATION BY COUNTIES

by a heavy toothed line. Practically speaking, the negro is confined to the eastern or agricultural portion of the state. The following six counties have the largest negro populations. For the purpose of comparison the white population is also given.

	NEGROES	WHITES
Harrison	21,697	10,174
Harris	19,894	43,846
Robertson	16,747	14,707
Smith	16,043	21,318
Washington	16,039	16,888
McLennan	14,405	45,345

The representation of the remaining colored races is too small to be of any special significance at this time.

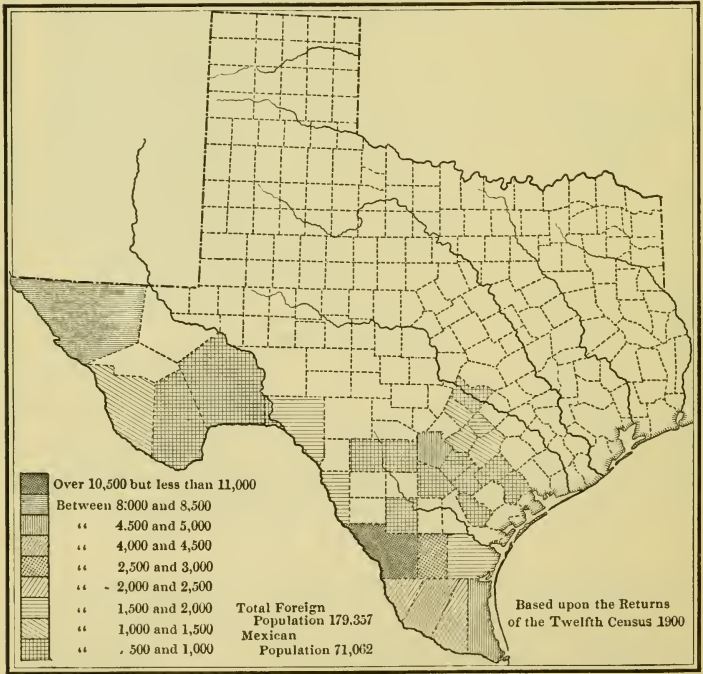


FIG. 97. MAP OF TEXAS SHOWING THE DISTRIBUTION OF THE MEXICAN POPULATION BY COUNTIES

131. Foreign-Born Population. The foreign-born population is 179,357. Its chief representatives are as follows:

Mexicans	71,062	Austrians	6,870
Germans	48,295	Irish	6,173
Bohemians	9,204	Swedes	4,388
English	8,213	Italians	3,942

The Mexican population occupies for the most part the region along the Rio Grande, together with that portion

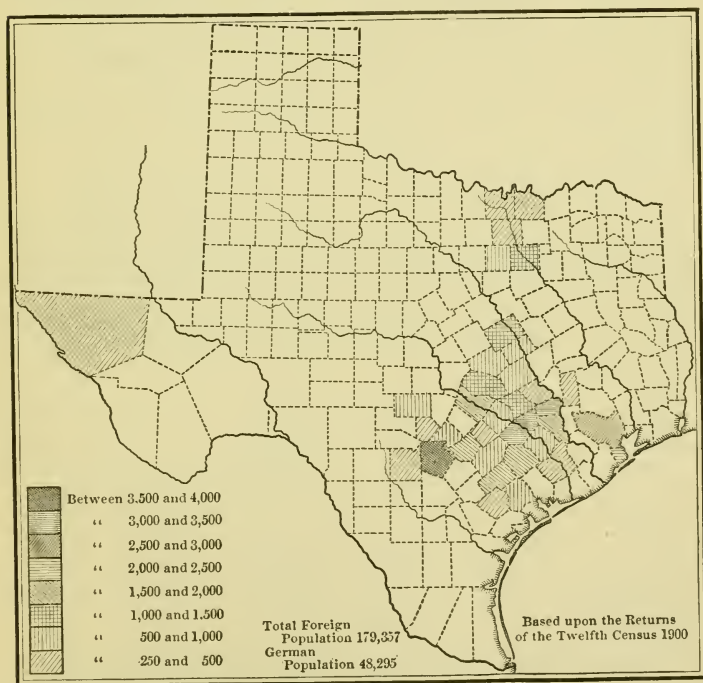


FIG. 98. MAP OF TEXAS SHOWING THE DISTRIBUTION OF THE GERMAN POPULATION BY COUNTIES

of the state lying between the Gulf and a line drawn due east from the Great Bend of the Rio Grande to the Colorado river. The five counties having the largest population of this nationality are:

Webb	10,755	Bexar	4,752
El Paso	8,368	Starr	4,262
Cameron	4,906		

The German population early established itself in south central and southwest Texas, and to-day the larger part of the citizens of German birth are found within that area. The five counties having the largest German population are:

Bexar	3958	Harris	2572
Washington	3281	Galveston	2450 ¹
Fayette	3055		

The Bohemian population is found for the most part in the south central portion of the state, where it has established itself in the drainage basins of the Brazos and Colorado rivers, beginning with the third tier of counties from the coast. The four counties having the largest Bohemian population are:

Fayette	2203	Austin	877
Lavaca	1835	Burleson	594

The Swedish population is largely confined to five counties:

Travis	1259	Wharton	306
Williamson	779	Harris	205
Galveston	394		

¹ The figures here given do not represent the entire number of the German-speaking people. In addition to the native Germans there are numerous descendants of the colonists who settled at New Braunfels, Fredericksburg, and elsewhere.

The English and Irish do not show a tendency to segregate or form communities by themselves, but, on the contrary, are widely distributed throughout the general population of the state. As may be expected they are most numerous in the larger cities, as is shown by the following table :

	ENGLISH	IRISH
Galveston county	873	814
Galveston	776	763
Bexar county	822	537
San Antonio	723	473
Harris county	648	537
Houston	546	485
Dallas county	512	458
Dallas	381	365
Tarrant county	297	350
Fort Worth	225	274

The counties having the largest Italian populations are:

Galveston	560	Harris	392
Brazos	553	Bexar	316
Erath	429		

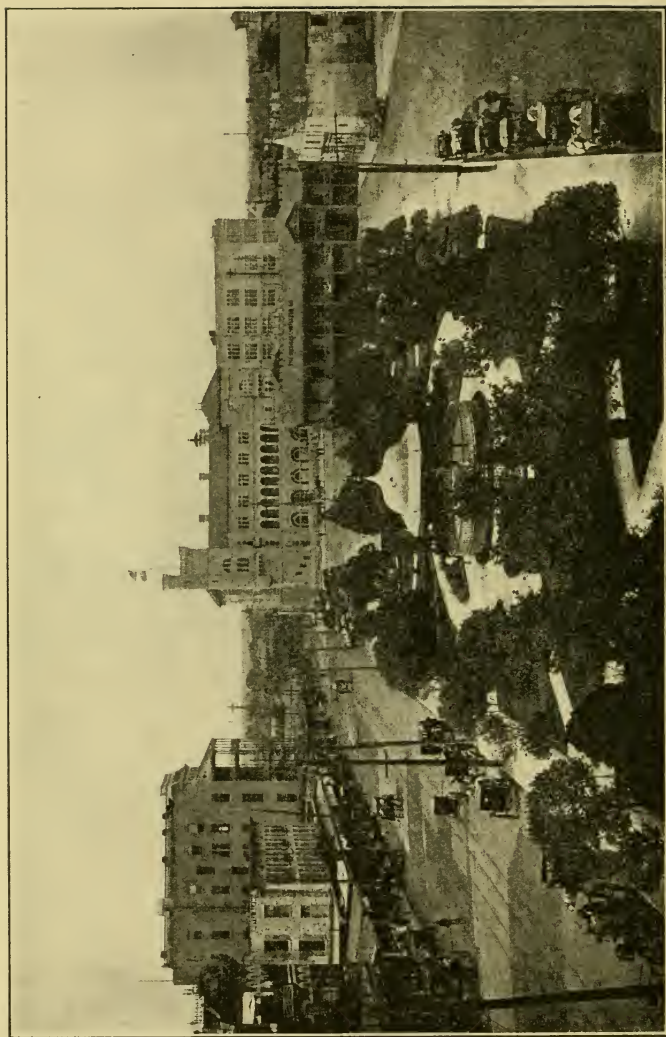


FIG. 99. ALAMO PLAZA, SAN ANTONIO

The low building on the right is the historic Alamo. Copyright, 1903 and 1904, by Nic. Teng. Used by permission

CHAPTER XV

THE PRINCIPAL CITIES OF TEXAS

132. (1) **San Antonio** (53,321),¹ the county seat of Bexar (Bair) county and widely known as the "Cradle of Texas Liberty," is situated in the southwestern part of the state, on the San Antonio river. Founded by the Spanish in 1718, it still retains a distinctive Spanish cast. It is, however, in every respect a modern city: its buildings, both public and private, are attractive; its streets and

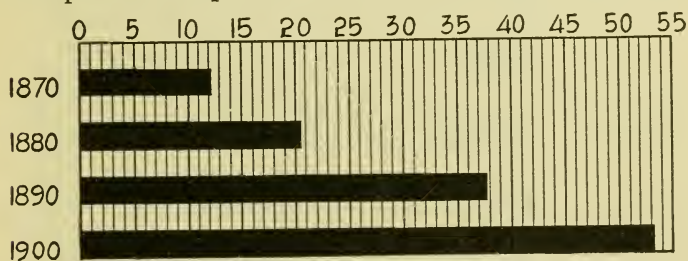


FIG. 100. DIAGRAMMATIC ILLUSTRATION OF THE INCREASE OF POPULATION IN SAN ANTONIO, 1870-1900

parks well kept; its transportation facilities excellent; and its business facilities commanding.

The increase of population in San Antonio by decades from 1870 to 1900 is illustrated by a comparison of the lengths of the black horizontal lines in the accompanying diagram, the vertical divisions of which represent thousands.

¹ The number preceding each city or town indicates its rank; the number following, its population according to the Twelfth Census, unless otherwise stated.

To this enumeration there should be added a floating population, now numbering several thousand, consisting of tourists and other visitors who temporarily reside in the city for health or pleasure.

The comparative numerical strength of the chief elements of the foreign population (9348) is indicated by the

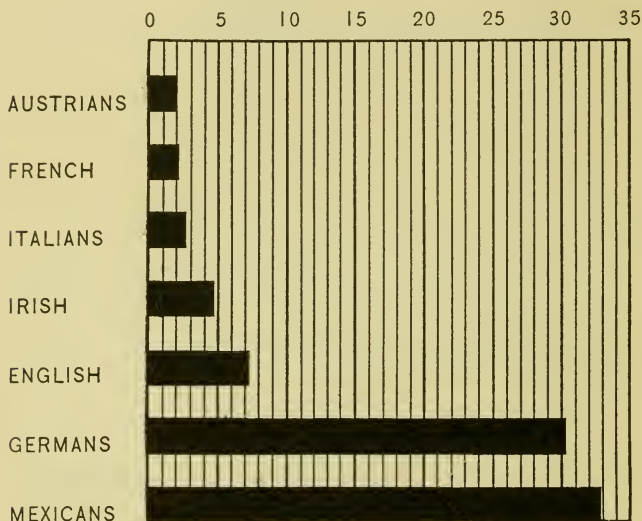


FIG. 101. DIAGRAMMATIC ILLUSTRATION OF THE NUMERICAL STRENGTH OF THE FOREIGN POPULATION OF SAN ANTONIO

lengths of the black horizontal lines in the following diagram, the vertical divisions of which represent hundreds. It will be seen that the Mexicans and Germans are in the ascendency, each numbering over three thousand.

The public buildings of the city represent the expenditure of over \$1,000,000. They include the Courthouse, situated on Main Plaza; the Federal Building, on the north



FIG. 102. COURTHOUSE AND MAIN PLAZA, SAN ANTONIO
Copyright, 1903 and 1904, by Nic. Tengg. Used by permission



FIG. 103. FEDERAL BUILDING, SAN ANTONIO
Copyright, 1903 and 1904, by Nic. Tengg. Used by permission

side of Alamo Plaza ; the City Hall, in the center of Military Plaza ; and the Market House and Convention Hall, on Haymarket Plaza. There are, in addition, twenty-one public-school buildings valued at \$450,000.

Of the four hundred and twenty-five miles of streets within the corporate limits, fourteen are paved, seventy-one macadamized, and all are kept in an excellent condition. The city has also constructed a sewer system, at the cost of \$500,000, the length of which in the aggregate is seventy-one miles.

The striking features of San Antonio, however, are its parks and plazas, of which there are twenty-one. Much of historic interest centers at Alamo Plaza on account of the scenes enacted at and about the Alamo, which faces this park. Brackenridge Park, comprising two hundred acres, with its natural forest growth, and San Pedro Park, containing fifty acres, are spots of great natural beauty.

San Antonio river, rising from a number of springs just north of the city limits, is a very picturesque stream. So tortuous is its course that for thirteen miles it flows within the city. Its tributary, San Pedro creek, also meanders through the city for its entire length, which is nearly ten miles.

On account of the salubrity of its climate and the excellence of its water supply, the product of artesian wells, San Antonio has become favorably known as a health resort.

In addition to twenty-nine private schools and colleges, which are located here, public schools taught by one hundred and fifty teachers, and fifty-five churches, representing the various religious bodies, are maintained for the benefit of the public. Some of the finest church buildings face Travis Park.

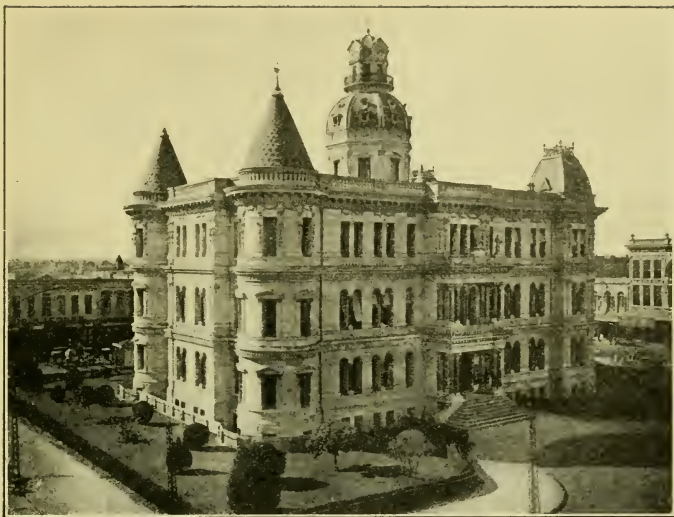


FIG. 104. CITY HALL AND MILITARY PLAZA, SAN ANTONIO
Copyright, 1903 and 1904, by Nic. Tengg. Used by permission



FIG. 105. VIEW ON WEST COMMERCE STREET, SAN ANTONIO
Copyright, 1903 and 1904, by Nic. Tengg. Used by permission

Fort Sam Houston, on Government Hill, one of the largest military posts in the country, is the headquarters of the Department of Texas. Its buildings and equipment represent an expenditure of nearly \$1,000,000.

San Antonio has a large trade with Mexico and with southern and western Texas. There are in the city eleven large wholesale houses devoted to the needs of an area exceeding in size many of the states, while the banking interests are represented by five national and six private institutions. Its manufacturing enterprises, moreover, include two of the largest breweries in the South, also several flouring mills, printing houses, binderies, iron works, machine shops, cement works, marble works, candy factories, paper-box factories, etc.

The railroad facilities of the city are excellent, lines radiating in many directions: the International and Great Northern to the northeast and southwest; the Galveston, Harrisburg and San Antonio (more widely known as the Southern Pacific or the Sunset Route) to the east and west; the Missouri, Kansas and Texas to the northeast; the San Antonio and Aransas Pass to the northwest and southeast; and the San Antonio and Gulf Railroad to the southeast. On the other hand, internal communication is maintained by a modern and well-equipped electric street-car system having a total length of sixty-one miles.

The greatest interest centers about the "missions," of which there are several. These buildings, both church and fortress, played an important part in the early Texas struggles. The mission of San Antonio de Valero (*dā vī-lā'rō*), better known as the Alamo, was the scene of the massacre of 1836. Here, before the overwhelming force of Santa Anna, fell the little band of Texas patriots fighting

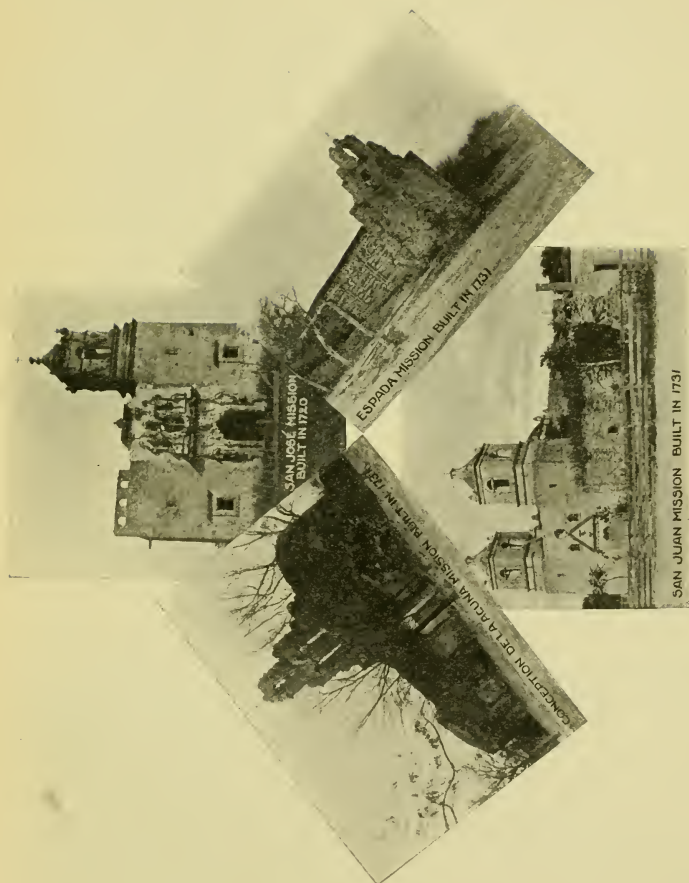


FIG. 106. THE MISSIONS NEAR SAN ANTONIO

to the last man — Travis and Bowie, Bonham and Crockett, the bravest of the brave. The Alamo is situated on Alamo Plaza and is now the property of the state.

The mission of La Purissima Concepción (*poo-rē'sǎ-mā con-sep-sē-ōn'*), or First Mission, on the left bank of the San Antonio river, was the scene of the conflict between the Texans under Colonel James Bowie and Captain J. W. Fannin and the Mexican troops in 1835. Before a force of ninety-two Texans four hundred Mexicans fled, leaving their cannon behind. While but one of the former was killed and one wounded, the latter lost sixty killed and many wounded.

The mission of San José de Aguayo (*san ho-sā' dā ä-gwä'yo*), or Second Mission, is situated on the right bank of the river, four miles below the city. It is especially celebrated for the exquisite carvings which ornament its front.

Still further below are the remaining missions: that of San Juan de Capistrano (*san hwan dā cäp-ēs-trä'no*), or Third Mission, on the left bank of the river, six miles from the city, and that of San Francisco de la Espada (*dā lä es-pä'dā*), or Fourth Mission, on the right bank of the river, nine miles from the city. In the square of the last mentioned the Texas army gathered prior to the engagement at Concepcion.

133. (2) **Dallas** (including Oak Cliff, 46,268), the county seat of Dallas county and the largest city in north Texas, is situated on the Trinity river, three hundred and fifteen miles northwest by north of Galveston. It lies in the most thickly settled portion of the state and is widely known for the excellence of its public buildings, hotels, business blocks, churches, and schools. The new County



FIG. 107. DALLAS COUNTY COURTHOUSE, DALLAS



FIG. 108. MAIN STREET, DALLAS

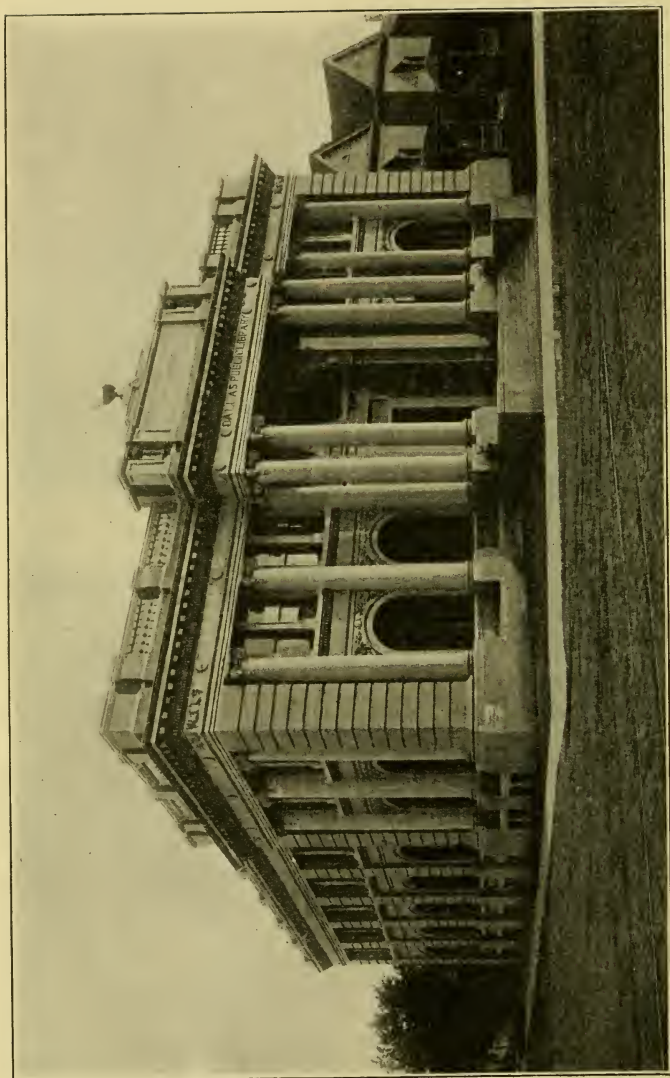


FIG. 109. DALLAS PUBLIC LIBRARY

Courthouse, the Public Library, the Federal Building, the City Hall, the Young Men's Christian Association Building, the new City National Bank Building, and the Exchange National Bank Building are noteworthy. The new Wilson Office Building is the finest in the state.

The city has waterworks, supplied from the Trinity river, artesian wells, a sewer system, many miles of paved streets, gas and electric lights. Located in the fertile black-soil belt, which extends from Austin to the Red river, it is the largest distributing point for agricultural machinery in the Southwest. It has a large whole-sale trade and a well-deserved reputation for



FIG. 110. THE WILSON OFFICE BUILDING,
DALLAS

the manufacture of harness and saddlery; indeed it is said that the factories are larger and the general business interests greater in this direction than in any other city in the United States.

Of the two hundred and eighty industrial establishments in Dallas, mention may be made of the following. The

Continental Gin Company and the Murray Company, manufacturers of cotton-ginning machinery, are among the largest plants of their kind in this country. The works of the former cover eight acres and give employment to three hundred men; the works of the latter cover fourteen acres and give employment to six hundred men. There are ten machine shops, three boiler and tank factories, two compresses, two cotton-seed-oil mills, a paper mill, three chemical works, two meat-packing establishments, a brewery, a cotton mill, brick, lime, and cement works, planing mills, flouring mills and elevators, and candy factories.

Many large commercial and financial institutions have their headquarters here. There are four national banks, one private bank, and a number of savings and loan companies. The general offices of the Texas and Pacific Railway and of the Missouri, Kansas and Texas Railway of Texas are also located here.

The public schools occupy thirteen large buildings representing an investment of nearly \$500,000. In addition there are many private schools, among which are Saint Mary's College (Protestant Episcopal) and the Ursuline Academy (Roman Catholic) for the education of young women. There are also three medical colleges and a large sanitarium, Saint Paul's, under the care of the Sisters of Saint Vincent de Paul.

Dallas is also an important railroad center, seven railroads radiating in twelve directions: the Houston and Texas Central to the north and to the south; the Texas and Pacific to the east and to the west; the Missouri, Kansas and Texas to the northeast, south, and northwest; the Gulf, Colorado and Santa Fé to the northeast and southwest; the Saint Louis Southwestern ("Cotton Belt")

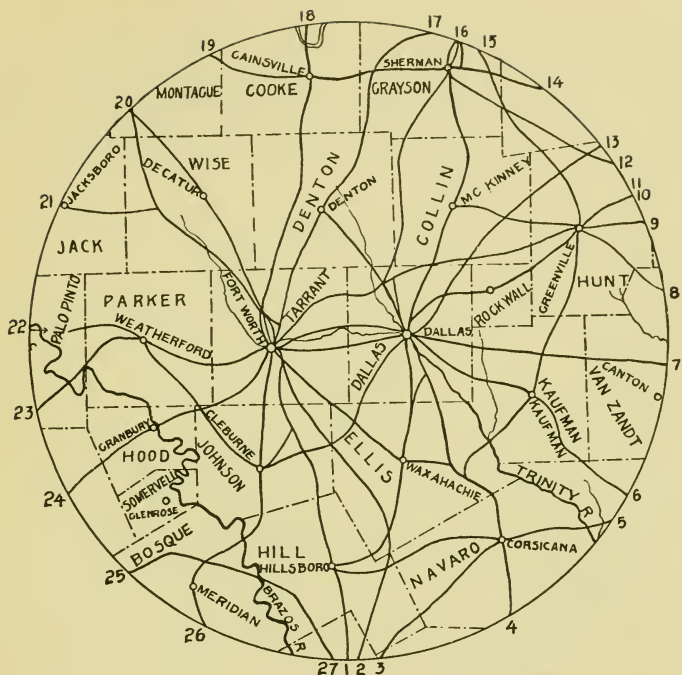


FIG. 111. MAP OF THE DALLAS-FORT WORTH REGION, SHOWING THE VARIOUS RAILROADS WHICH CONVERGE AT DALLAS AND FORT WORTH

(Diameter of the circle, 150 miles)

1. Missouri, Kansas and Texas. 2. International and Great Northern.
3. Saint Louis Southwestern. 4. Houston and Texas Central. 5. Saint Louis Southwestern.
6. Texas and New Orleans. 7. Texas and Pacific. 8, 9. Lines of the Missouri, Kansas and Texas. 10, 11. Saint Louis Southwestern and Texas Midland.
12. Saint Louis Southwestern. 13. Gulf, Colorado and Santa Fé. 14. Texas and Pacific. 15. Missouri, Kansas and Texas.
16. Missouri, Kansas and Texas; Houston and Texas Central; and Texas and Pacific. 17. Missouri, Kansas and Texas. 18. Gulf, Colorado and Santa Fé.
19. Missouri, Kansas and Texas. 20. Fort Worth and Denver City and Chicago, Rock Island and Gulf. 21. Chicago, Rock Island and Gulf.
22. Weatherford, Mineral Wells and Northwestern. 23. Texas and Pacific. 24. Fort Worth and Rio Grande.
25. Texas Central. 26. Gulf, Colorado and Santa Fé. 27. Texas Central

to the northeast; the Texas and New Orleans to the southeast; and the Chicago, Rock Island and Gulf to the west. An interurban electric railway connects Dallas with Fort Worth, and within the city there are forty-seven miles of electric street railroad.

In 1900 the foreign-born population of the city amounted to 3381, one third of whom were Germans.

134. (3) Houston (44,633), the county seat of Harris county, is situated on Buffalo bayou, at the head of steam navigation. Although fifty miles northwest of Galveston, it has the advantage of direct water communication with the Gulf. It is the greatest railroad center in the state. Of the fourteen railroads entering the city, two, the Galveston, Harrisburg and San Antonio and the Texas and New Orleans, are links in a transcontinental system, the Southern Pacific. Of the other railways, the Houston, East and West Texas and the International and Great Northern afford communication with the northeast and north; the Houston and Texas Central and the Missouri, Kansas and Texas with the west, northwest, and north; the Gulf, Colorado and Santa Fé with the northwest, north, and south; and the San Antonio and Aransas Pass with the west and southwest. Besides these there are several lines extending to Galveston and the coast country.

Houston has many modern buildings, and its business blocks and stores, especially its wholesale houses, are indicative of its commercial importance. Thirty-five miles of the principal streets have recently been paved with vitrified brick or asphalt, not to mention the miles of streets and roadways that have been macadamized. There have also been constructed thirty-five miles of sewers, which add much to the comfort and health of the citizens.

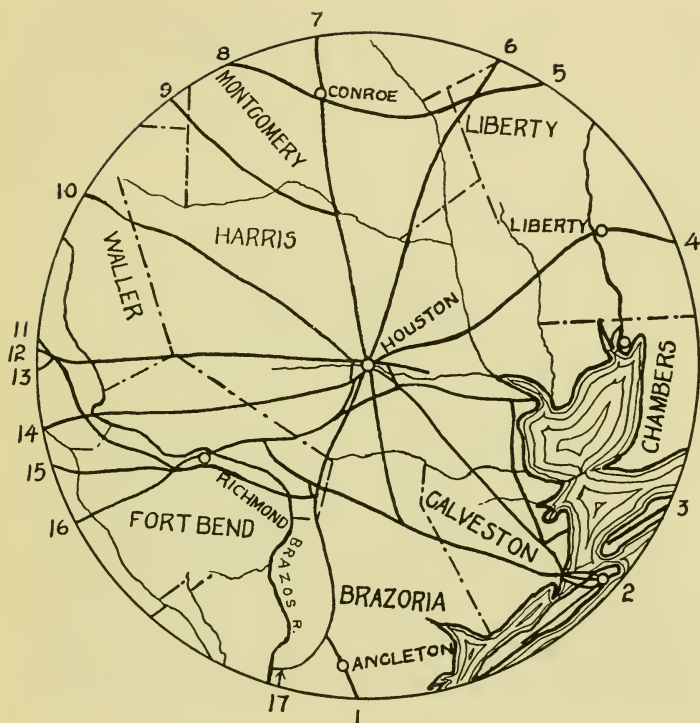


FIG. 112. MAP SHOWING HOUSTON AS A RAILROAD CENTER

(Diameter of the circle, 100 miles)

1. Velasco, Brazos and Northern. 2. Gulf, Colorado and Santa Fé; Galveston, Houston and Henderson; and Galveston, Houston and Northern.
3. Gulf and Interstate. 4. Texas and New Orleans (Southern Pacific).
5. Gulf, Colorado and Santa Fé. 6. Houston, East and West Texas.
7. International and Great Northern. 8. Gulf, Colorado and Santa Fé.
9. International and Great Northern. 10. Houston and Texas Central.
11. Gulf, Colorado and Santa Fé. 12. Missouri, Kansas and Texas.
13. Cane Belt. 14. San Antonio and Aransas Pass. 15. Galveston, Harrisburg and San Antonio (Southern Pacific).
16. New York, Texas and Mexican. 17. International and Great Northern

Viewed from an educational standpoint, Houston is favored. It has seventeen public school buildings with a force of one hundred and seventy-three teachers, a Carnegie Library, and many private schools. Of the forty or more churches the building of the First Presbyterian congregation is the largest. Christ Church, grammar school, and



FIG. 113. BUSINESS BLOCK IN HOUSTON

rectory on Texas avenue should be mentioned, and also the Church of the Annunciation (Roman Catholic).

This city is one of the largest cotton markets in the world. It is also the seat of the East Texas lumber trade and the sugar and rice industries of the state. The last, now in its beginning, is rapidly increasing and is prophetic of great results. The banking facilities are excellent, there being six national and three private institutions, and since the discovery of oil in the Beaumont region all

forms of business have been greatly stimulated. Among the manufacturing establishments located here are the shops of three railroads, three cotton compresses, four cotton-seed-oil mills, two breweries, a meat-packing house, car-wheel works, two rice mills, an oil refinery, a flour mill,



FIG. 114. HOUSTON HIGH SCHOOL BUILDING

an ice factory, lumber mills, and a number of smaller plants. The city has waterworks, electric lights and gas, and thirty-six miles of electric street railway. Within the last few years it has greatly prospered and its growth has been very rapid.

135. (4) **Galveston** (37,789), the principal seaport of Texas, is situated at the northeast extremity of the island of the same name, fifty-one miles southeast of Houston.

North of the city lies Galveston bay, the entrance to which has been greatly improved by the construction of jetties. The shifting sands and bars having been removed, deep-water ships can now be brought directly to the wharfs for loading and unloading. Since the destructive storm of September 8, 1900, the shipping facilities along the water front have been much increased, and the export and import trade is in a better condition than at any previous time in the history of the city. Galveston is already famous for its immense cotton shipments, amounting in 1904 to 2,406,031 bales, valued with by-products, at \$121,869,176. Extensive arrangements have been made for the shipment and storage of grain, the total elevator capacity being at this time 4,000,000 bushels. During 1904 over 17,000,000 bushels of wheat were handled, representing a value of nearly \$13,500,000. In addition to the cotton by-products, — such as cotton-seed oil, oil cake and meal, — logs, staves, and lumber of various kinds, and live stock are exported, the latter chiefly to Cuba. Furthermore, imported goods are received here not only for the cities of the Southwest and Middle West but for Mexico as well. That the importance of Galveston as a Gulf port may be fully realized, attention is called to the fact that 86,227 loaded cars were handled in the yards of the Galveston Wharf Company in 1904.

Six lines of European steamships have established regular sailings from this point, and many others are concerned in its carrying trade. An excellent service is also maintained with New York.

Five railroads now enter the city, three using one track in common, namely, the Galveston, Houston and Henderson, the International and Great Northern, and the Missouri,

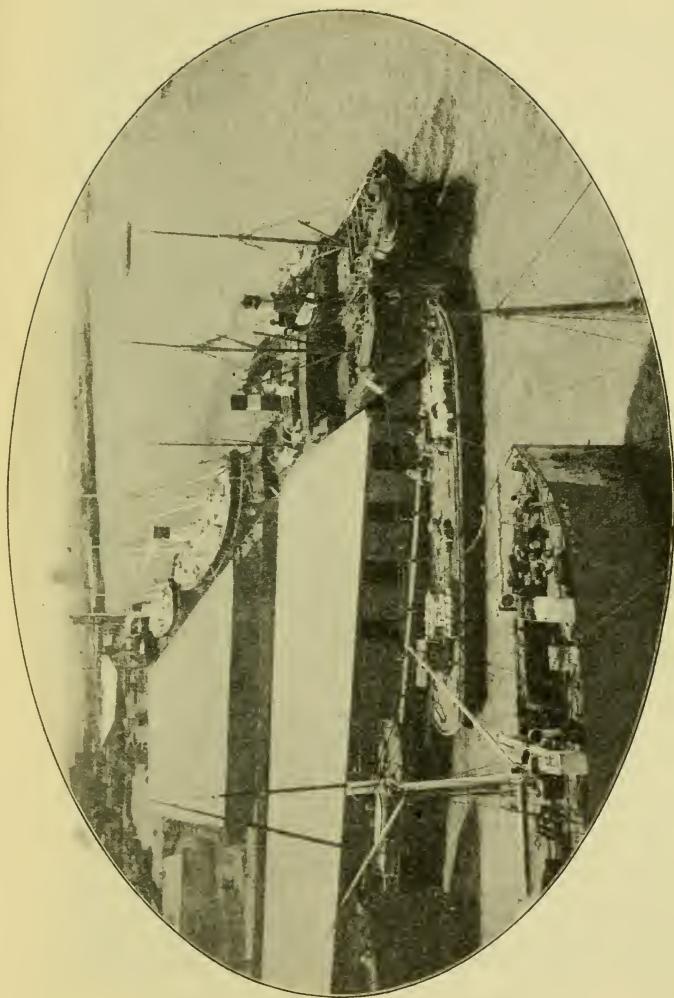


FIG. 115. WHARF SHEDS AND STEAMSHIPS AT GALVESTON
The barge in the foreground is discharging cotton. A large elevator is seen in the distance

Kansas and Texas. The Gulf, Colorado and Santa Fé also connects the city with Houston, but its main line, running in a northwest direction, reaches the populous region of northern Texas. The Galveston, Houston and Northern (Southern Pacific) extends from Houston to Galveston via West Laporte on the bay. The Gulf and



FIG. 116. BUILDING THE GALVESTON SEA WALL

The granite riprap for protection on the Gulf side is shown in the foreground. To the right are seen the timber molds for the concrete

Interstate Railway from Beaumont to Port Bolivar reaches Galveston by means of a ferry transfer.

Since the storm in 1900 building has been actively carried on and public improvements have been undertaken which will render the repetition of the great tidal disaster impossible. An immense sea wall 17 feet high, 16 feet wide at the base, and 17,593 feet long is now completed. The

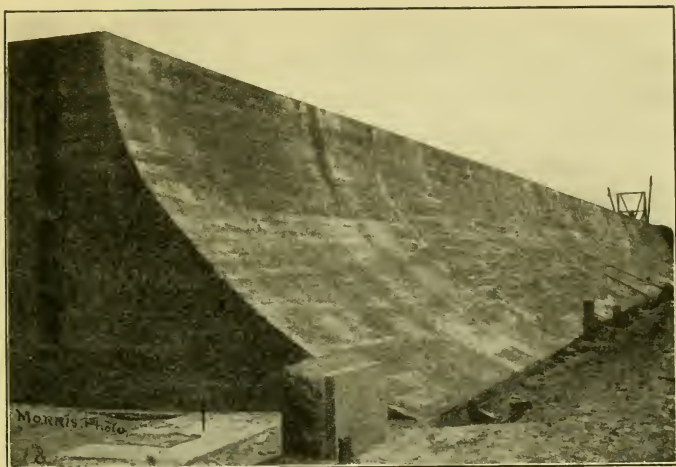


FIG. 117. THE GALVESTON SEA WALL
A completed section after the mold had been removed



FIG. 118. THE GALVESTON SEA WALL

This view is from the top of the wall looking west. The riprap is shown on the left. Within the wall, on the right, the grade is to be raised by a filling of sand

wall itself is of concrete and rests upon piling driven to the depth of 40 feet. On the front or exposed side it is protected by a riprap of large granite blocks brought from Granite mountain in Burnet county. On the inner side the grade is to be raised by a filling of sand, thus completing an effectual barrier to further encroachments



FIG. 119. GALVESTON LOOKING WEST FROM THE COURTHOUSE

The building in the center is the Ball High School

of the sea. For this work a bond issue of \$1,500,000 was authorized.

Galveston has a large wholesale trade in dry goods, groceries, and clothing. Its public schools have long been known for their excellence, especially the Ball High School. The Medical Department of the State University is located here (see Fig. 90), also the John Sealy Hospital and Saint Mary's Infirmary, the latter under the care of the Sisters of the Incarnate Word. The city is governed by a board of five commissioners elected by the qualified voters.

136. (5) **Fort Worth** (26,688), the county seat of Tarrant county, is situated on the Trinity river thirty-two miles west of Dallas. It is one of the most enterprising cities in the state, with many fine business blocks and residences.



FIG. 120. TARRANT COUNTY COURTHOUSE, FORT WORTH

Among its new and costly buildings may be mentioned the County Courthouse, the Federal Building, the Texas and Pacific Passenger Station, and the Carnegie Library.

This city is another large railroad center, no less than ten lines converging here. The Texas and Pacific, extending from New Orleans to El Paso, is joined at this point by its transcontinental branch from Texarkana via Paris, Sherman, and Whitesboro. The Fort Worth and Denver City crosses the Panhandle and, with the Colorado Southern, forms a through line to Denver. The Chicago,

Rock Island and Gulf, in connection with the Chicago, Rock Island and Pacific, reaches the Indian Territory, Oklahoma, and the many points on the Rock Island system. The Gulf, Colorado and Santa Fé, from Galveston, passes through the city and, continuing northward, connects with the great network of railroads in Kansas and other western



FIG. 121. TEXAS AND PACIFIC PASSENGER STATION, FORT WORTH

states. The Missouri, Kansas and Texas, from Galveston and San Antonio via Waco and Fort Worth, extends to Denison, thence to the Indian Territory and the states to the northeast. The Saint Louis Southwestern ("Cotton Belt") extends in a general eastern direction to Texarkana, thence to Saint Louis. The recently constructed Fort Worth Division of the International and

Great Northern extends in a southeastern direction to Houston. The Fort Worth and Rio Grande, building in a southwest direction, has now reached Brady. The "Frisco" enters the city by the Red River, Texas and Southern Railway from Sherman, and the Houston and Texas Central by means of a branch from Garrett.

Among the industrial establishments of Fort Worth are found the shops of several railroads, three grain elevators, two flour mills, five ice factories, a compress, a cotton-seed-oil mill, two foundries, three breweries, etc. Its

meat-packing houses and stock yards rank next to those of Kansas City. Two establishments have a daily capacity of a thousand cattle and twenty-five hundred hogs. A large wholesale trade in groceries, dry goods, drugs, hardware, crockery, furniture, and lumber is centered here, Fort Worth being a distributing point for the Panhandle country. The banking interests include six national banks, a savings bank, and a trust company.



FIG. 122. POST OFFICE, FORT WORTH

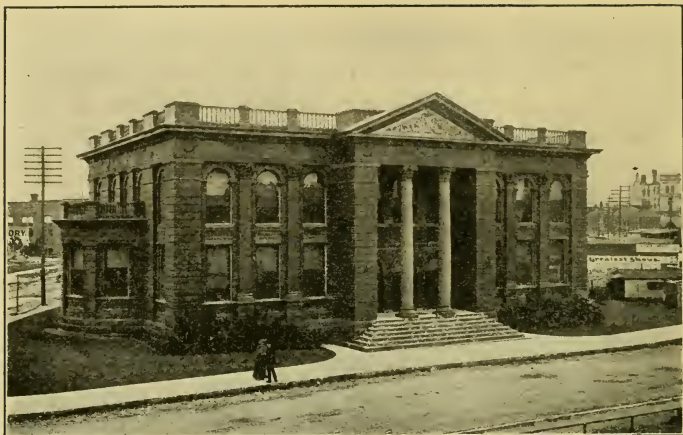


FIG. 123. CARNEGIE PUBLIC LIBRARY, FORT WORTH

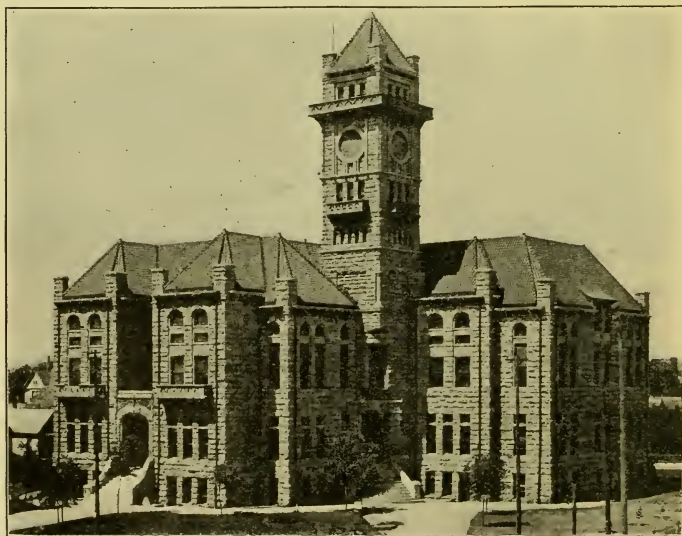


FIG. 124. CITY HALL, FORT WORTH

The city has many churches, a fine system of public schools, a university under the auspices of the Methodist Episcopal Church, a polytechnic college under the auspices of the Methodist Episcopal Church South, and many private institutions. There are electric street railways, including an interurban line to Dallas, waterworks, electric light and gas plants, paved and graded streets, all of which indicate energy and thrift on the part of its inhabitants.

137. (6) Austin (22,258), the county seat of Travis county and since 1839 the capital of Texas, is beautifully located on the Colorado river, eighty-one miles northeast of San Antonio. It is situated at the foot of the Balcones scarp, just below the canyon portion of the Colorado valley. Its site is somewhat irregular, being traversed by Shoal creek on the west and Waller creek on the east. The original limits of the city have long since been outgrown, and it has now spread to the north and east and even to the south across the river. The new State Capitol (see frontispiece), said to be the seventh largest building in the world, occupies a commanding position on Capitol Hill, and its dome, surmounted by the Goddess of Liberty holding aloft the "lone star," is visible for miles. This magnificent edifice is built of red granite from Burnet county. It contains the offices of the governor and of the various officials who conduct the business of the state, the rooms of the Supreme Court, of the Court of Civil Appeals, third supreme judicial district, the Railroad Commission, the State Library, the Library of the Supreme Court, and the halls of the two branches of the legislature, the Senate and the House of Representatives. The General Land Office occupies a building at the southeast corner of the Capitol grounds. Half a mile north of the Capitol are

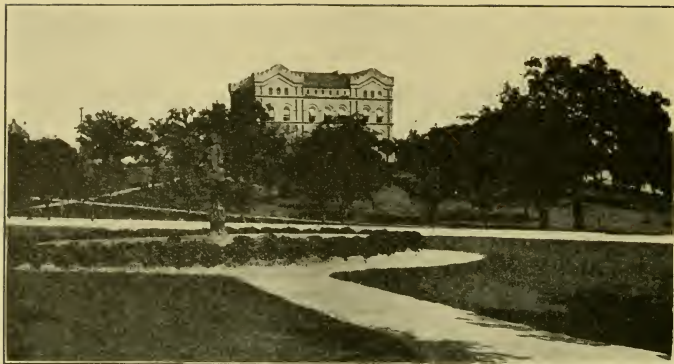


FIG. 125. GENERAL (STATE) LAND OFFICE FROM CAPITOL
GROUNDS, AUSTIN



FIG. 126. FEDERAL BUILDING, AUSTIN

In this building are located the Post Office, Federal Court rooms, and
the Internal Revenue offices

the campus and buildings of The University of Texas (see Fig. 89), the largest educational institution in the state. The Lunatic Asylum, the Institute for the Blind, the Deaf and Dumb Asylum, and the Institute for the Deaf, Dumb, and Blind Colored Youths are all located in Austin. The city has excellent schools, public and private. Saint Mary's Academy for girls and Saint Edward's College for



FIG. 127. SETON INFIRMARY, AUSTIN

This large and well-equipped hospital is conducted by the Sisters of Charity of Saint Vincent de Paul

boys and young men, the latter three miles south of the city, are well-known Catholic institutions. There are also two colleges for the training of colored students. Austin has many churches, a theological seminary under the auspices of the Presbyterians, three hospitals, electric street cars, waterworks, electric lights, and gas. That it is largely a residence city is shown by its numerous and attractive homes. Among its industries may be mentioned two ice

factories, a large cotton compress, a cotton-seed-oil mill, a cannery, marble works, a saddlery and harness manufactory, and two large printing and publishing houses. Other business interests are represented by several wholesale houses dealing in groceries, hardware, dry goods, and notions, a fire-insurance company, and five national banks.

The main line of the International and Great Northern Railroad, from Laredo on the Mexican frontier, passes through the city, also the Austin branch of the Houston and Texas Central Railroad, from Hempstead on the main line to Llano; while the recent extension of a branch of the Missouri, Kansas and Texas Railway from Granger affords another desirable outlet.

138. (7) Waco (20,686), the county seat of McLennan county, is situated on both banks of the Brazos, near the mouth of Bosque river. eighty-nine miles south of Fort Worth. Surrounded by a fertile farming land, it is one of the most prosperous cities in the state. It is well built and covers an area of about four square miles. In addition to its importance as a large inland cotton market, it maintains an extensive trade with other parts of the state, as is shown by the number and character of its wholesale houses dealing in groceries, hardware, drugs, boots and shoes, machinery and farming implements, saddlery, etc. Among the industries of the city are four cotton compresses, two cotton-seed-oil mills, a large cotton and woolen mill, a flour mill, two grain elevators, two ice factories, a beef and pork packing house, two planing mills, an iron foundry, boiler and machine works, and a number of smaller manufactories. The business interests centered here are sufficient to maintain three national banks and three other financial institutions.

Waco has many excellent buildings, of which the new Courthouse, the Federal and the Provident buildings, and the City Hall are noteworthy examples. Churches and schools abound; indeed so numerous are the latter that Waco is often called "the Athens of Texas." Of the higher institutions of learning mention may be made of Baylor University, Baptist, the oldest college in the state; Texas Christian University, Christian (formerly Add-Ran) University; Saint Basil's College; the Academy of the Sacred Heart; and Paul Quinn College for negroes. The public schools are excellent and well equipped.

The city water supply is derived in part from a remarkable series of artesian wells and in part from tubular wells sunk in the land bordering the Brazos river.

As at Dallas and Fort Worth, railroads radiate from Waco in many directions: the Missouri, Kansas and Texas to the north and south; branches of the International and Great Northern and of the Houston and Texas Central to the east and southeast respectively; the Saint Louis Southwestern ("Cotton Belt") to the northeast and southwest; the San Antonio and Aransas Pass to the south; and the Texas Central to the northwest. The city has an excellent electric street-car service, and is lighted by both electricity and gas.

139. (8) **El Paso** (15,906), the county seat of El Paso county, is situated on the left bank of the Rio Grande, in the extreme western part of the state, opposite the Mexican city of Ciudad Juarez (*sē-ōō-dād' hwä'rās*). The American settlement that sprung up here after the Mexican War was first known as Franklin, but later, about 1860, its name was changed to El Paso. Where in 1880 there stood a small village with only 736 inhabitants there is



FIG. 128. A PART OF EL PASO. MOUNT FRANKLIN IN THE
BACKGROUND

From the El Paso Album, by permission. Copyright, 1903



FIG. 129. EL PASO COUNTY COURTHOUSE, EL PASO

From the El Paso Album, by permission. Copyright, 1903

now a modern well-built city with many excellent public buildings, churches, and schools.

On account of its altitude, 3720 feet above the level of the sea. El Paso has justly become famous as a health resort. It is a port of entry, and in the magnificent Federal Building are found the offices of the Custom House, the Post Office, and the United States Court rooms. The



FIG. 130. CITY HALL, EL PASO

From the El Paso Album, by permission. Copyright, 1903

imports received here, especially ores and bullion, are very large. Among other articles of import are hides, cattle, and tropical fruits. The exports, on the other hand, are largely manufactured goods, chiefly machinery.

The commercial prosperity of El Paso is for the most part due to the mineral wealth tributary to the city. The smelting works, three miles west of town, are among the

largest in the world, employing from 1200 to 1500 men. Ores are shipped to these works from various parts of Mexico, New Mexico, and Arizona. East of town there is a smaller smelter belonging to the Federal Copper Company.

The city has three national banks, one private bank, gas, water, and electric-light plants, a sewer system, fifteen



FIG. 131. AN EL PASO SMELTER

From the El Paso Album, by permission. Copyright, 1903

miles of electric street railway, a number of large wholesale and jobbing houses, two foundries and machine shops, three harness and saddlery factories, a carriage and wagon factory, two ice factories, two refrigerator plants, cigar factories, and stock yards.

The public schools are among the best in the state. In them provision is made for American, Mexican, and negro

pupils. The high school has a new and thoroughly modern building and is well furnished and equipped. Hotel Dieu is an excellent hospital under the management of the Sisters of Charity of Saint Vincent de Paul.

El Paso has eight railroads. The Galveston, Harrisburg and San Antonio Railroad from the east and the Southern Pacific from the west, links in the transcontinental "Sunset Route," join here. This city is the western terminus of the Texas and Pacific Railway and the northern terminus of the Mexican Central. A branch of the Santa Fé extends northward to Albuquerque, and by means of the El Paso and Northeastern system connection is made with the Rock Island system at Santa Rosa, New Mexico. The recently constructed Rio Grande, Sierra Madre and Pacific Railway has opened up important territory to the southwest in Mexico, and the El Paso Southwestern Railroad, the "Bisbee" line, affords direct communication with the rich mining regions of New Mexico, Arizona, and the Republic.

On account of the aridity of the western portion of Texas, agriculture is impossible without irrigation. In the valley of the Rio Grande, both above and below El Paso, water may be obtained either directly from the river or from wells tapping an inexhaustible underflow. In this region there are many excellent farms and valuable orchards, gardens, and vineyards.

140. (9) Laredo (13,429) is located on the Rio Grande, opposite the Mexican town of Nueva Laredo, one hundred and fifty-three miles southwest of San Antonio. It is the county seat of Webb county and is an important business center. The International and Great Northern Railroad connects here with the National Railroad of Mexico, forming

a through line to the city of Mexico. The Rio Grande and Eagle Pass Railway extends in a northwest direction thirty miles to the Santo Tomas coal field, and the Texas-Mexican Railway affords communication with Corpus Christi on the Gulf coast.

Like El Paso and Eagle Pass, Laredo serves as a gateway to the Mexican republic, hence it is often called the "Gate City." It has two national banks, six churches, and both public and private schools. Among the latter is a seminary for Mexican girls, in connection with which there is also a military school for boys. These institutions are under the auspices of the Methodist Episcopal Church South. The industrial establishments of Laredo include the extensive shops of the National Railroad of Mexico and several large brickmaking plants.

A considerable business is conducted with Mexico, especially in the line of hardware. The city is a shipping point for hides and wool. Two bridges span the Rio Grande at this point, one exclusively for the railroad and the other for wagons and foot passengers. The excellent onions raised on the irrigated lands in this vicinity have acquired more than a local reputation, and other vegetables thrive when supplied with a sufficient amount of moisture.

141. (10) **Denison** (11,807), three miles south of Red river and nine miles north of Sherman, is an important railroad town. It originated with the Missouri, Kansas and Texas Railway and is the focal point of the "Katy" system in Texas. It is also the northern terminus of the Houston and Texas Central Railroad. The Saint Louis, San Francisco and Texas and the Texas and Pacific railways afford many valuable connections, especially to the north, northeast, east, and southwest. Among the

industries of the town are the shops of the Missouri, Kansas and Texas Railway, said to be the largest in the state, employing several hundred men, a large cotton-seed-oil mill, a compress, several gins, a large flour mill, two planing mills, an ice factory, three storage plants, brick-yards, cattle pens, and stock yards.

Denison has two national banks, a trust company, two wholesale groceries, waterworks, a sewerage system, street cars, electric lights, etc. There are many churches and schools. Among the latter is Saint Xavier's Convent. As has been remarked, "the city is very advantageously situated": the coal fields of the Indian Territory are close at hand, the adjacent country is well adapted to diversified farming and fruit growing, and timber for various purposes is easily obtained.

142. (11) Sherman (10,243), the county seat of Grayson county, lies sixty-four miles north of Dallas and nine miles south of Denison, with which it is connected by both steam and electric railways. In addition to the railroad facilities enjoyed by the latter, namely, those afforded by the Missouri, Kansas and Texas, the Houston and Texas Central, and the Saint Louis, San Francisco and Texas railways, Sherman is reached by the transcontinental division of the Texas and Pacific, the Saint Louis Southwestern ("Cotton Belt"), the Gulf, Colorado and Santa Fé, and the Texas, Red River and Southern, the last mentioned affording direct communication with Fort Worth.

A large amount of business is centered here. Among the commercial and industrial enterprises of the city are three banks, two large wholesale groceries, two wholesale hardware establishments, three lumber yards, two foundries, a bag factory, the largest cotton-seed-oil mill in the

world, a cotton compress, three flour mills, two planing mills, an ice factory and cold-storage plant, two large nurseries, and a brickyard.

Sherman is widely known for its educational institutions. In addition to its public schools, which are well conducted, Austin College (Presbyterian), Sherman Institute, Carr-Burdette Christian College, and Saint Joseph's Academy (Roman Catholic) are located here.

143. (12) Beaumont (9427; in 1905 estimated at 21,500), the county seat of Jefferson county, is situated on the Neches river, at the head of tide-water navigation, thirty miles from the Gulf of Mexico and eighty-four miles north of east from Houston. For many years it was the center of the East Texas timber trade, and from this point large shipments of pine and cypress are made. Since 1900 there has been a large increase in the population on account of the extraordinary discoveries of oil within a few miles of the city. As to railroads Beaumont is greatly favored. The main line of the Texas and New Orleans Railroad, forming a part of the great Southern Pacific transcontinental route from New Orleans to San Francisco, passes through the city. A branch of this road extends in a southeast direction to Sabine and another in a northwest direction to Dallas. The Texarkana and Fort Smith Railway (Kansas City Southern) affords northern connections via Shreveport, Texarkana, and Kansas City, also a Gulf connection at Port Arthur. The Gulf and Interstate Railway is a direct line from Beaumont to Galveston, while the Gulf, Beaumont and Kansas City Railway furnishes connections with the Santa Fé system.

From a business standpoint the city is very active. It has three national banks and three trust companies.

Among its industries are those concerned with the preparation of lumber and its products, such as sawmills, shingle mills, planing mills, and other woodworking plants, and a very large creosoting establishment. There are also boiler works, two iron works, tank factories, three rice mills, two ice factories, an electric-light plant, electric railways, brickyards, etc. The business blocks are, for the most part, modern structures especially erected to meet the needs of a growing city. Of other buildings, mention may be made of the Post Office, High School, Courthouse, and the new passenger station of the Texas and New Orleans Railroad. The municipal improvements include a sewerage system costing \$80,000 and paved streets for which over \$400,000 has been expended. The difficulties of securing wholesome water have now been overcome by the construction of an adequate waterworks plant.

CHAPTER XVI

CITIES AND TOWNS HAVING BETWEEN FIVE AND TEN THOUSAND INHABITANTS

144. (13) Paris (9358), the county seat of Lamar county, lies fifteen miles south of Red river and sixty-four miles east of Sherman. The region to the south and west, as well as that along Red river, is exceptionally rich and produces large crops of cotton and corn. The town is an important business center. It is the southern terminus of a branch of the "Frisco" system, by which direct connection is made with Saint Louis and other northern points. It is also the northern terminus of the Texas Midland, a railroad extending in a southwest direction to Ennis and of a branch of the Santa Fé from Cleburne. The Texas and Pacific Railway affords east and west connections.

Paris has three national banks and a trust company, a Federal Building, a cotton compress, a flouring mill, two cotton-seed-oil mills, a planing mill, an ice factory, waterworks, gas works, electric lights, and electric street-car service. It has also a very efficient system of public schools and is the seat of Mary Connor Female College.

145. (14) Corsicana (9313), fifty-five miles northeast of Waco, is the county seat of Navarro county. Since the discovery of oil in 1896 it has become a place of considerable importance. The oil wells here are not "gushers," as were those of the Beaumont field, but "pumpers."

Many have been put down on city lots and yield their owners a handsome income.

Corsicana has four banks, three national and one private. Its most important industry is an oil refinery. Among its other industries are a cotton compress, two cotton-ginning establishments, two cotton-seed-oil mills, a cotton mill manufacturing both bagging and sheeting, an ice factory,

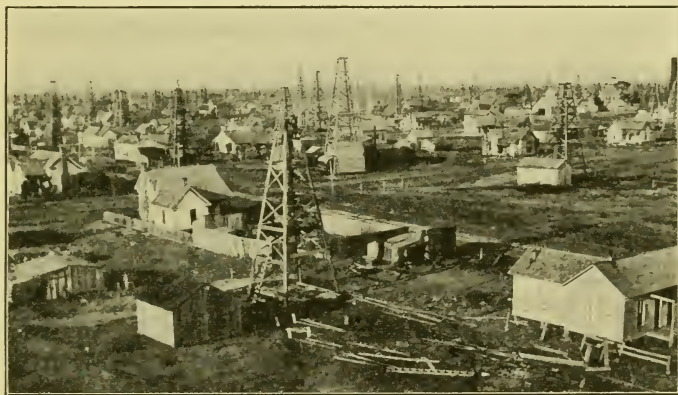


FIG. 132. VIEW IN THE CORSICANA OIL FIELD

A producing well in the front yard or back lot of a dwelling
is not uncommon

a cold-storage plant, and a planing mill. The State Orphans' Home and the Odd Fellows' Orphans' Home are both located here.

The town is situated at the crossing of the Houston and Texas Central and the Saint Louis Southwestern ("Cotton Belt") railways. It has seven public schools, fifteen churches, an electric-light plant, and an electric street railroad.

146. (15) Palestine (8297), the county seat of Anderson county, is a prosperous town on the International and Great Northern Railroad, at the junction of its lines from Laredo on the Mexican frontier and Galveston on the Gulf. It has three banks, two national and one private, a fine Young Men's Christian Association building, a compress, a cotton-seed-oil mill, waterworks, and electric lights. The general offices, shops, and hospital of the railroad are located here. The surrounding country is well adapted to agriculture and fruit growing.

At the saline, six miles west of Palestine, rock salt has been encountered by boring and a large salt-manufacturing plant established.

147. (16) Tyler (8069), the county seat of Smith county, is an important railroad town seventy-five miles northeast of Corsicana. Here are located the general offices, shops, and hospital of the Saint Louis Southwestern Railway of Texas ("Cotton Belt"). A branch of the International and Great Northern Railroad also passes through this place, affording connection with the main line at Troup and with the Texas and Pacific at Mineola.

Tyler has of recent years become well known for its large shipments of fine fruits. It has four banks, two national and two private, a cannery, an ice plant, waterworks, an electric-light plant, a compress, an oil mill, a box factory, and a sawmill. It also has a good system of public schools and many churches. The United States Circuit Court and the state Court of Criminal Appeals hold sittings here.

148. (17) Gainesville (7874), the county seat of Cooke county, is a thriving town at the crossing of the Gulf, Colorado and Santa Fé and the Missouri, Kansas and Texas railways, sixty-five miles north of Fort Worth and

six miles south of Red river. Situated in an excellent wheat- and cotton-growing region and having valuable fruit lands to the east and a cattle country to the northwest, it commands a good trade, both wholesale and retail. It has two national banks, five public schools, waterworks, and electric lights. Among its industries are the repair shops of the Santa Fé, a large flour mill, a foundry, a cotton-seed-oil mill, a compress, an ice factory, and a large grain elevator.

149. (18) Marshall (7855), the county seat of Harrison county, lies at the junction of two lines of the Texas and Pacific Railway, that from Texarkana and that from New Orleans, which uniting here form a through route to Dallas, Fort Worth, and the West. The Texas Southern Railway extends in a northwestern direction from this point, via Gilmer on the Saint Louis Southwestern Railway, to Winnsboro on the Missouri, Kansas and Texas Railway.

Marshall has two national banks, the extensive car and repair shops and the hospital of the Texas and Pacific Railway, a car-wheel foundry, a compress, a cotton-seed-oil mill, two saw and planing mills, an ice factory, waterworks, an electric-light plant, and a cannery. Situated within the East Texas lumber region, it is an important shipping point for the numerous sawmills in its vicinity. Bishop College and Wiley College, two large institutions for the education of colored people, are located here. Hynson's Iron Mountain Springs, six miles to the west, and Rosborough Springs, nine miles to the south, are well-known resorts.

150. (19) Cleburne (7493), the county seat of Johnson county, is situated on the Gulf, Colorado, and Santa Fé Railway, twenty-nine miles south of Fort Worth. The main line of this road, from Galveston, Houston, and Temple

to Purcell in the Indian Territory, via Fort Worth, is here joined by the branch from Paris via Dallas and that from Weatherford. Cleburne is also connected with the Missouri, Kansas and Texas Railway at Egan by a tap of ten miles, and is a station on the Trinity and Brazos Valley Railroad. It has three national banks, a private bank, and lying in the midst of a rich farming country it is an important point of shipment and trade. Among its industries are the extensive shops of the Santa Fé, a compress, two cotton-seed-oil mills, a flour mill, and elevators. The city has waterworks, electric lights, a Carnegie Library, many churches, and excellent public schools. Saint Joseph's Academy (Roman Catholic), a school for girls, is located here.

151. (20) Temple (7065) is situated in the northeast quarter of Bell county, at the crossing of the Gulf, Colorado and Santa Fé and the Missouri, Kansas and Texas railways, ninety-nine miles south of Cleburne and one hundred and twenty-eight miles south of Fort Worth. The town is surrounded by black land of great richness, and large quantities of cotton and grain are marketed there. It has three national banks, three cotton compresses, two cotton-seed-oil mills which do a flourishing business, the repair shops and hospital of the Santa Fé, waterworks, an ice factory, an electric-light plant, a flour mill, two wholesale groceries, a good system of public schools, and the King's Daughters Hospital.

152. (21) Greenville (6860), the county seat of Hunt county, fifty-four miles northeast of Dallas, is an important railroad center. Lines of the Missouri, Kansas and Texas Railway enter the city from five different directions. It is also reached by the Saint Louis Southwestern and the

Texas Midland railroads. It has good schools and numerous churches. Among the private institutions is Burleson College (Baptist). The surrounding country, which is well adapted to farming and stock raising, contributes much to the prosperity of the town. Its industries include a large cotton-seed-oil mill, an oil refinery, two compresses, an ice factory, a flouring mill, and railroad repair shops. The volume of business is sufficient for the maintenance of two national banks.

153. (22) Terrell (6330) is situated in the northern part of Kaufman county, at the crossing of the Texas and Pacific and the Texas Midland railroads, thirty-two miles east of Dallas. It is the shipping point of a rich agricultural, stock, and fruit country. The North Texas State Hospital for the Insane is located here, also the shops and hospital of the Texas Midland Railroad. Among the commercial and industrial enterprises of the town are two national banks, a cotton-seed-oil mill, a compress, an electric-light plant, a flouring mill, an ice factory, and a foundry. The public schools are well conducted and are in a flourishing condition.

154. (23) Brownsville (6305), the most southern city in the state, is built on the left bank of the Rio Grande opposite Matamoras, Mexico. It is the county seat of Cameron county and enjoys an extensive trade with the neighboring Republic. It is also the southern terminus of the Saint Louis, Brownsville, and Mexico Railway, locally known as the "Lott Road," a Gulf coast line, and the western terminus of the Rio Grande Railroad, a short line running to Point Isabel. The city has two national banks, a private bank, a Courthouse, a Federal Building, a large rice mill, a sugar mill, several wholesale houses, and an ice

factory. On the irrigated lands in its vicinity rice, alfalfa, and vegetables are successfully grown. Steam navigation on the river is limited.

155. (24) Brenham (5968), the county seat of Washington county, is situated at the crossing of the Gulf, Colorado and Santa Fé and the Houston and Texas Central railroads, seventy-one miles northwest of Houston. Located in the midst of a rich agricultural region, it has become an important shipping point and business center. It has a large cotton-seed-oil mill, two cotton compresses, a cotton mill, a foundry, an electric-light plant, a brickyard, and numerous smaller industries. There are two banks, one national, the other private, excellent public schools, and two colleges, the Blinn Memorial (German Methodist) and the Evangelical Lutheran.

156. (25) Hillsboro (5346), the county seat of Hill county, lies thirty-four miles north of Waco, at the junction of the Missouri, Kansas, and Texas lines from Dallas and from Fort Worth. It is also reached by a branch of the Saint Louis Southwestern from Corsicana, and is a station on the Trinity and Brazos Valley Railroad.

The business portion of the town is well built. A handsome Courthouse adorns the public square, and there are many attractive residences. One of the largest compresses in the state is located here. Other industries include a cotton mill, cotton-seed-oil mills, flour mills, and an ice factory.

Hillsboro has five banking institutions, three national and two private. It is an important shipping point for live stock, — horses, mules, cattle, and hogs. Large crops of cotton, corn, and small grains are produced in its vicinity.

157. (26) **Texarkana** (5256 in Texas, 4914 in Arkansas; total population 10,170) is the designation of "twin cities" on the Arkansas-Texas line, each of which has its own municipal government. They, however, constitute one community, and while their business and industries will be treated separately, a correct conception is possible only by considering both cities as a unit. With this understanding, we may say that Texarkana is an important railroad town, being the southern terminus of the Saint Louis, Iron Mountain and Southern Railway, the eastern terminus of the main line and transcontinental divisions of the Texas and Pacific Railway, and the northern terminus of a branch line to Shreveport. It is also the eastern terminus of the Saint Louis Southwestern Railway of Texas, which here connects with the Saint Louis Southwestern, and an important station on the Kansas City Southern ("Port Arthur Route"), the Texas portion of which is known as the Texarkana and Fort Smith Railway. Situated in a forested region, an extensive trade has been developed in pine lumber, shingles, furniture, and wooden ware.

In the Texas city there are a national and a private bank, one of the largest ice plants in the state, a compress, a cotton-seed-oil mill, a handle factory, and a brickyard. It has also the general offices of the Texarkana and Fort Smith Railway, repair shops of the Texas and Pacific Railway, and is the division headquarters of all the railroads centering at this point. Among its improvements are a City Hall, six office buildings, an opera house, six churches, many macadamized streets, a sewer system, and an electric street-car line.

The Arkansas city is the county seat of Miller county. It has a Courthouse, City Hall, two national banks, two

large sawmills, gas works, waterworks, novelty works, and an electric-light plant; also two wholesale grocery houses and a wholesale dry goods establishment. The hospital of the Saint Louis Southwestern Railways ("Cotton Belt") is located here. The city has eight blocks of paved streets, a sewer system, and electric street cars. The Federal Building is on the state line. A Federal Court, however, sits in each city.

158. (27) Bonham (5042) is a thriving town on the Texas and Pacific Railway, twenty-six miles east of Sherman. It is also connected with Denison by the Denison, Bonham and New Orleans Railroad, which is leased and operated by the Missouri, Kansas and Texas Railway. Fannin county, of which it is the county seat and principal point of shipment, is widely known on account of the excellence of its land and the heavy crops of cotton, corn, and grain there produced. The raising of fine stock is a growing industry in this region, and the culture of fruit is now receiving attention.

Bonham has two national banks, an electric street railway, waterworks, and good schools, public and private. Among the latter is Carlton College, an institution for the education of young ladies, conducted under the auspices of the Christian Church. The industrial establishments of the town include two large flour mills, a cotton mill, a cotton-seed-oil mill, cotton gins, a compress, an ice factory, and an electric-light plant.

CHAPTER XVII

CITIES AND TOWNS HAVING BETWEEN TWENTY-FIVE HUNDRED AND FIVE THOUSAND INHABITANTS

159. (28) **Ennis** (4919) is situated in the eastern part of Ellis county, on the Houston and Texas Central Railroad, thirty-four miles southeast of Dallas. It is also the southern terminus of the Texas Midland Railroad. Like other towns of the Black Prairie belt, it is surrounded by rich farming lands. It has two national banks, the repair shops of the Houston and Texas Central Railroad, a large compress, a cotton-seed-oil mill, an ice factory, and yards for feeding and shipping cattle.

160. (29) **Weatherford** (4786), the county seat of Parker county, is situated on the Texas and Pacific Railway, thirty-one miles west of Fort Worth. It is connected with Cleburne by the Gulf, Colorado and Santa Fé Railway, and with Mineralwells by the Weatherford, Mineral Wells and Northwestern Railway. The town is well built, with brick and stone business blocks, and is a commercial center of importance. It has three national banks, electric lights, and waterworks. Among its shipments are cotton, grain, hides, and live stock. Its industries include a cotton compress, a cotton-seed-oil mill, a cotton-yarn mill, three gins, two foundries, two ice factories, a pottery, a flouring mill, and a planing mill. The Texas Female College (Cumberland Presbyterian) is located here.

161. (30) **Corpus Christi** (4703), the county seat of Nueces county, is an attractive town on Corpus Christi bay, one hundred and forty-nine miles south-southeast of San Antonio. It is reached by the San Antonio and Aransas Pass and the Texas Mexican railways. On account of its position on the Gulf coast, Corpus Christi is an excellent health resort for both summer and winter. It has two national banks, a good Courthouse, four public schools, and ample accommodations for the numerous visitors who frequent the shore at all seasons. Its shipments include vegetables from the truck farms in the vicinity, fish and oysters, cotton, wool, and hides.

162. (31) **McKinney** (4342), the county seat of Collin county, is a thriving town at the junction of the Houston and Texas Railroad and the McKinney branch of the Missouri, Kansas and Texas Railway, thirty-two miles north of Dallas. It has a fine Courthouse, two national banks, a private bank, artesian waterworks, a cotton compress, a cotton-seed-oil mill, a round-bale gin, an electric-light plant, an ice factory, a flour mill and elevator, a large nursery, two wholesale grocery houses, many churches, and excellent schools. The surrounding country is in a high state of cultivation.

163. (32) **Gonzales** (4297), the county seat of Gonzales county, is an old Texas town, settlement having been made in 1835. It is situated on the Guadalupe river, near the mouth of the San Marcos, sixty-five miles east of San Antonio. The construction of a dam at this point has furnished sufficient power to operate a gin, a gristmill, waterworks, an ice factory, and an electric-light plant. The town has a national bank, two private banks, eight churches, and excellent public schools, and in addition to

the industries mentioned above, a round-bale cotton gin, two ordinary gins, a cotton factory, a cotton-seed-oil mill, and a brickmaking plant.

Gonzales is known as the "Lexington of Texas." Here, by command of Colonel John H. Moore, was fired the first gun of the Texas revolution (October 2, 1835). The town is reached by the Galveston, Harrisburg and San Antonio and the San Antonio and Aransas Pass railways.

164. (33) Waxahachie (4215), the county seat of Ellis county, is a cotton market of much importance. It is said that more of that commodity is sold from wagons here than at any other place in the world. It is situated at the crossing of the Missouri, Kansas and Texas and the Houston and Texas Central railroads, thirty-one miles south of Dallas. It has a new and costly Courthouse, a City Hall, the N. P. Sims Public Library, city waterworks, three national banks, a private bank, two loan and trust companies, a large cotton factory, a compress, two cotton-seed-oil mills, a flouring mill, ice and electric-light plants, and street cars. Trinity University, the chief educational institution of the Cumberland Presbyterians, is located here. The surrounding country is very rich, and in addition to raising cotton, corn, and grain, the farmers are giving much attention to fine stock.

165. (34) Taylor (4211) is a prosperous town in Williamson county, thirty-five miles by rail northeast of Austin. It is located at the crossing of the International and Great Northern and Missouri, Kansas and Texas railroads, and is the principal point of shipment for a large territory. It has three national banks, several wholesale houses, two cotton-seed-oil mills, a cotton compress, the repair shops of the International and Great Northern Railroad, a large

flour mill, an ice factory, an electric light and power plant, waterworks, etc. Within the limits of the town there are several artesian wells. The surrounding country is very rich and excellently adapted to cotton, corn, and grain. Here also the cultivation of fruit and vegetables and the rearing of fine stock are growing industries.

166. (35) Denton (4187), the county seat of Denton county, is situated on the Texas and Pacific and the Missouri, Kansas and Texas railways, thirty-seven miles northwest of Dallas and thirty-six miles north-northeast of Fort Worth. It has three national banks, a large flour mill, elevators, a cotton-seed-oil mill, cotton gins, a brickyard, a planing mill, a cannery, waterworks (artesian), and an electric-light plant. The North Texas State Normal College (a large school for the training of teachers), the recently established Girls Industrial College, and the John B. Denton College are located here.

167. (36) Victoria (4010), the county seat of Victoria county, is situated on the Guadalupe river, at the junction of the New York, Texas and Mexican and the Gulf, Western Texas and Pacific railways (Southern Pacific). The town is twenty-seven miles northwest of Port Lavaca on the Gulf and in the midst of an agricultural and stock-raising region. It has a good stone Courthouse, a national bank, two private banks, a City Hall, waterworks, a cotton-seed-oil mill, electric lights, and excellent public schools. It is also the seat of Nazareth Academy and Saint Joseph's College (Roman Catholic).

Victoria is often called the "City of Roses." Its streets are remarkably well kept and beautifully shaded with trees. Many wealthy stockmen have their homes here. Among the articles of export are cattle, hides, and cotton.

168. (37) Brownwood (3965), the county seat of Brown county, is situated on Pecan bayou, at the junction of the San Angelo branch of the Gulf, Colorado and Santa Fé and the Fort Worth and Rio Grande railways, one hundred and forty-one miles southwest of Fort Worth. It is the seat of Daniel Baker College (Presbyterian), and of Howard Payne College (Baptist). It has a national bank and two private banks, a compress, a cotton-seed-oil mill, two flouring mills, an ice factory, and a harness and saddlery manufactory. The gathering and shipment of pecan nuts is an important industry. It is said that the groves of pecan trees in this vicinity are unexcelled in the state.

169. (38) Navasota (3857) is situated in the southwestern part of Grimes county, seventy miles northwest of Houston. It lies on the west bank of the Navasota river, near its confluence with the Brazos. Lines of the Gulf, Colorado and Santa Fé, the Houston and Texas Central, and the International and Great Northern railroads afford excellent connections. Many of the business houses are built of brick and stone. The town has two national banks, a City Hall, waterworks, and electric lights. Its industries include a large cotton-seed-oil mill, a cotton compress, two machine shops, an ice factory, a wagon factory, and bottling works. The surrounding country produces large quantities of cotton. Truck farming (the raising of vegetables) is also carried on in the vicinity.

170. (39) Orange (3835), the county seat of Orange county, lies on the right bank of the Sabine river, twenty-two miles east of Beaumont. It is an attractive town, with good public buildings, hotels, and business blocks. Its railroads are two in number, the Texas and New

Orleans (Southern Pacific) and the Orange and Northwestern. The latter connects with the Texarkana and Fort Smith Railway (Kansas City Southern) at Maurice, and with the Gulf, Beaumont and Kansas City (Santa Fé) at Buna.

Orange is in a rice- and cotton-growing country and is also the point of shipment of large quantities of lumber and shingles. It has two national banks, five saw and shingle mills, a rice mill, a large paper mill (using pine shavings), a foundry, an ice factory, and an electric-light plant.

171. (40) Belton (3700), the county seat of Bell county, lies eight miles south of west of Temple, on the line of the San Angelo branch of the Gulf, Colorado and Santa Fé Railway. It is also reached by a tap of the Missouri, Kansas and Texas Railway from Echo, near Temple. Among the industries of the town are a large cotton mill, a cotton-seed-oil mill, a flouring mill, and an electric-light plant. Belton has a national and two private banks, an excellent Courthouse, a Carnegie Public Library, and waterworks. As an educational center it is well known, being the seat of Baylor Female College (Baptist), one of the oldest institutions in the state, and of Belton Academy, a leading preparatory school.

172. (41) Sulphur Springs (3635), the county seat of Hopkins county and an important town on the Saint Louis Southwestern Railway and the Shreveport line of the Missouri, Kansas and Texas Railway, is situated thirty-one miles east of Greenville and seventy-one miles south-east of Sherman. The surrounding country is not only well adapted to general agriculture, producing cotton and corn in abundance, but to the growth of fruits and

vegetables as well. The town has two national banks, a fine Courthouse, a college, and good public schools. Among its industries are a compress, two cotton-seed-oil mills, cotton gins, an ice plant, an electric-light plant, several furniture and woodworking establishments, and a brickyard.

173. (42) **Longview** (3591), the county seat of Gregg county, is the northern terminus of the main line of the International and Great Northern Railroad and of the Texas, Sabine Valley and Northwestern Railway. The Texas and Pacific furnishes east and west connections. The town has the International and Great Northern repair shops, a foundry and machine shop, a compress, a cotton-seed-oil mill, plow works, a box factory, a sawmill, an ice factory, and an electric-light plant. There are two national banks at this point. Situated in the Forested area, lumbering, as well as agriculture and fruit growing, is an important industry of the surrounding country.

174. (43) **Bryan** (3589), the county seat of Brazos county, is located on the Houston and Texas Central and the International and Great Northern railroads, ninety-eight miles northwest of Houston. The Brazos bottom is one of the richest agricultural regions in the state, and a large part of its cotton product is marketed and shipped at this point. The town has a national and a private bank, a Carnegie Public Library, an Ursuline Academy for girls (Roman Catholic), and a Collegiate Institute (Baptist). Among its industrial establishments are a compress, a cotton-seed-oil mill, a sawmill and gristmill, and a number of small manufacturing plants. The Agricultural and Mechanical College at College Station, four miles to the south, is a large contributor to the volume of its retail trade.

175. (44) Yoakum (3499) is a thriving railroad town in the northern part of Dewitt county, a hundred and seventy-one miles south of Waco and a hundred and nineteen miles southwest of Houston. It is situated on the San Antonio and Aransas Pass Railway, at the junction of its lines from the above-named cities. This road also affords direct communication with San Antonio and Corpus Christi. The town is well built, has a national and a private bank, waterworks, electric lights, and good schools. The round-house and repair shop of the San Antonio and Aransas Pass Railway, a cotton compress, cotton gins, and an ice plant are located here. The surrounding country is productive and devoted principally to raising cotton and corn.

176. (45) Cuero [*kwa-rō*] (3422), the county seat, is situated near the center of Dewitt county, two miles from the Guadalupe river. It is one hundred and thirty-seven miles by rail southwest of Houston and twenty-eight miles northwest of Victoria. The San Antonio and Aransas Pass Railway affords communication with San Antonio, Corpus Christi, and Houston, and the Gulf, Western Texas and Pacific Railway with Victoria. It has two private banks, a national bank, waterworks, electric lights, public and private schools. Among its industries are a cotton compress, a cotton-seed-oil mill, a cotton factory, and several gins. A new Courthouse has recently been erected. The dam across the river, three miles above the town, has rendered the irrigation of a large tract of land possible, besides furnishing power to the cotton mill. Cotton is the chief product of the surrounding country, though vegetables in considerable quantities are raised and shipped to the larger cities of the state.

177. (46) Abilene (3411) is the county seat of Taylor county. It is situated on the Texas and Pacific Railway, one hundred and sixty-one miles south of west from Fort Worth, and is an important point for the shipment of grain, cotton, and stock. The town is one of the most progressive in the state. It has a Federal Building, two national banks, a cotton compress, a cotton-seed-oil mill, a flour mill, an ice factory, an electric-light plant, and waterworks. The well-built business blocks, the schools, churches, and attractive homes furnish abundant evidence of thrift and prosperity. The State Epileptic Colony (an asylum for the afflicted) and Simmons College (Baptist) are located here.

178. (47) Cameron (3341), the county seat of Milam county, lies on the left bank of Little river, fifty-three miles south of Waco. The Gulf, Colorado and Santa Fé and the San Antonio and Aransas Pass railways cross at this point. The town, situated in the midst of a fine agricultural region, has a costly Courthouse, two national banks, a cotton compress, a cotton-seed-oil mill, an ice factory, waterworks, and an electric-light plant.

179. (48) Calvert (3322) is situated in the western part of Robertson county, on the Houston and Texas Central and the International and Great Northern railroads. It has a national and a private bank, waterworks (artesian), a compress, a cotton-seed-oil mill, an ice factory and electric-light plant, and is a point of shipment for agricultural products and lignite, large deposits of the latter having been opened up in its vicinity.

180. (49) Marlin (3092), the county seat of Falls county and an important business center, is situated near the Brazos river, twenty-six miles below Waco. It is located in the midst of a very fertile region, and the curative

properties of its artesian hot well¹ have given the town a wide reputation as a health resort. It has two national banks, a compress, a cotton-seed-oil mill, an ice factory, waterworks, and an electric-light plant. The Fort Worth Division of the International and Great Northern and the branch of the Houston and Texas Central from Bremond to Waco cross here, affording excellent facilities for transportation.

181. (50) Jefferson (2850), the county seat of Marion county, lies at the head of navigation on Big Cypress bayou, at the crossing of the Texas and Pacific and the Missouri, Kansas and Texas railways. It has a handsome Federal Building for the use of the United States Court and Post Office, a private bank, extensive sawmills, a cotton compress, a cotton-seed-oil mill, an iron furnace, iron works, gas works, an ice factory, and an electric-light plant. Situated in the Forested area of the state, it is the shipping point for large quantities of lumber.

182. (51) Georgetown (2790), the county seat of Williamson county, is located at the junction of the North and South forks of the San Gabriel river, twenty-eight miles by rail north of Austin. It is reached by a tap of the International and Great Northern Railroad from Roundrock, and also by the Austin branch of the Missouri, Kansas and Texas Railway from Granger. The town has excellent schools, many churches, and is the seat of Southwestern University, a flourishing institution under the

¹ This well was drilled by the city at a cost of \$30,000. It is 3330 feet deep, flows at the rate of 80,000 gallons per day, has a temperature of 147 degrees Fahr., and a pressure of 97 pounds to the square inch. See "Geography and Geology of the Black and Grand Prairies, Texas," by Robert T. Hill, *Twenty-first Annual Report of the United States Geological Survey*, Part VII, p. 645.

auspices of the Methodist Episcopal Church South. It has a national and a private bank, a cotton-seed-oil mill, a flouring mill, waterworks, and electric lights.

183. (52) San Angelo (in 1890, 2615; estimated population, 1900, 5000¹), the county seat of Tom Green county, is located near the junction of the North and Middle forks of the Concho river, two hundred and twenty-seven miles west of Temple. It is the terminus of a branch of the Gulf, Colorado and Santa Fé Railway and the distributing and shipping point for a large territory. Its main industries are those connected with stock raising and wool growing, but in the vicinity of the rivers there is much irrigated farming, and vegetables, especially celery, are successfully grown. The town has a good Courthouse, three national banks, a private bank, public and private schools, waterworks, an electric-light plant, an ice factory, several wholesale houses, and a carriage factory. A telephone system connecting the various ranches has its headquarters here.

184. (53) Crockett (2612), the county seat of Houston county, is situated on the International and Great Northern Railroad, thirty-eight miles south of Palestine. It is in the East Texas lumber region, and the surrounding country is well adapted to the growth of fruits and vegetables. It has two national banks, and among its industrial establishments are a cotton-seed-oil mill, a compress, saw and planing mills, an ice factory, and an electric-light plant.

185. (54) Bowie (2600), sixty-nine miles northwest of Fort Worth, lies in the southwest part of Montague county, at the crossing of the Fort Worth and Denver City and the Chicago, Rock Island and Gulf railways. The adjacent

¹ No returns given in the reports of the Twelfth Census.

region is valuable not only for general agriculture but also for fruit culture. Bowie has two national banks, and its industries include a cotton compress, a cotton-seed-oil mill, a flouring mill, a fruit cannery, an ice factory, and an electric-light plant. It is an important shipping point for farm products, cotton, and fruit. Coal seam No. 7 (see Fig. 72) has been worked near the town.

186. (55) Smithville (2577), an important railroad town, is situated in the western part of Bastrop county, fifteen miles southeast of Bastrop, at the junction of three lines of the Missouri, Kansas and Texas Railway. The machine shops and roundhouse of that railway are located here. Other industries include a cotton compress, a cotton-seed-oil mill, electric-light and ice plants, and a local brick-making establishment. The railroad branch of the Young Men's Christian Association has a building at this point, and there is also a national bank.

187. (56) Rockdale (2515) is a prosperous town at the crossing of the International and Great Northern Railroad and the San Antonio and Aransas Pass Railway, sixteen miles south of Cameron, in Milam county. It has a national bank, excellent schools, waterworks, a cotton-seed-oil mill, an ice factory and electric-light plant. Lignite is successfully mined in its vicinity. Cotton and grain are the chief shipments.

APPENDIX

THE COUNTIES OF TEXAS

NAME	AREA (Square Miles)	POPULATION (Twelfth Census)	COUNTY SEAT
Anderson	1,060	28,015	Palestine
Andrews	1,591	87	
Angelina	880	13,481	Lufkin
Aransas	295	1,716	Rockport
Archer	960	2,508	Archer City
Armstrong	870	1,205	Claude
Atascosa	1,182	7,143	Pleasanton
Austin	712	20,676	Bellville
Bailey	1,000	4	
Bandera	1,007	5,332	Bandera
Bastrop	881	26,845	Bastrop
Baylor	957	3,052	Seymour
Bee	875	7,720	Beeville
Bell	1,091	45,535	Belton
Bexar	1,268	69,422	San Antonio
Blanco	762	4,703	Johnson City
Borden	892	776	Gail
Bosque	972	17,390	Meridian
Bowie	907	26,676	Boston
Brazoria	1,438	14,861	Angleton
Brazos	510	18,859	Bryan
Brewster	5,006	2,356	Alpine
Briscoe	850	1,253	Silverton
Brown	911	16,019	Brownwood
Burleson	677	18,367	Caldwell
Burnet	1,010	10,528	Burnet

NAME	AREA (Square Miles)	POPULATION (Twelfth Census)	COUNTY SEAT
Caldwell	530	21,765	Lockhart
Calhoun	592	2,395	Port Lavaca
Callahan	882	8,768	Baird
Cameron	2,203	16,095	Brownsville
Camp	217	9,146	Pittsburg
Carson	860	469	Panhandle
Cass	945	22,841	Linden
Castro	870	400	Dimmitt
Chambers	648	3,046	Wallisville
Cherokee	990	25,154	Rusk
Childress	660	2,138	Childress
Clay	1,250	9,231	Henrietta
Cochran	959	25	
Coke	850	3,430	Robert Lee
Coleman	1,302	10,077	Coleman
Collin	828	50,087	McKinney
Collingsworth	867	1,233	Wellington
Colorado	948	22,203	Columbus
Comal	569	7,008	New Braunfels
Comanche	828	23,009	Comanche
Concho	941	1,427	Paintrock
Cooke	1,000	27,494	Gainesville
Coryell	1,115	21,308	Gatesville
Cottle	956	1,002	Paducah
Crane	850	51	
Crockett	3,004	1,591	Ozona
Crosby	984	788	Emma
Dallam	1,463	146	Texline
Dallas	900	82,726	Dallas
Dawson	900	37	
Deaf Smith	1,477	843	Hereford
Delta	266	15,249	Cooper
Denton	865	28,318	Denton
Dewitt	880	21,311	Cuero
Dickens	918	1,151	Dickens

NAME	AREA (Square Miles)	POPULATION (Twelfth Census)	COUNTY SEAT
Dimmit	1,164	1,106	Carrizo Springs
Donley	878	2,756	Clarendon
Duval	1,887	8,483	San Diego
Eastland	947	17,971	Eastland
Ector	976	381	Odessa
Edwards	2,408	3,108	Rocksprings
Ellis	1,066	50,059	Waxahachie
El Paso	9,353	24,886	El Paso
Erath	1,110	29,966	Stephenville
Falls	844	33,342	Marlin
Fannin	940	51,793	Bonham
Fayette	992	36,542	Lagrange
Fisher	836	3,708	Roby
Floyd	1,036	2,020	Floyddada
Foard	636	1,568	Crowell
Fort Bend	897	16,538	Richmond
Franklin	325	8,674	Mount Vernon
Freestone	947	18,910	Fairfield
Frio	1,064	4,200	Pearsall
Gaines	1,590	55	
Galveston	438	44,116	Galveston
Garza	821	185	
Gillespie	1,140	8,229	Fredericksburg
Glasscock	952	286	Garden City
Goliad	817	8,310	Goliad
Gonzales	1,079	28,882	Gonzales
Gray	860	480	
Grayson	1,012	63,661	Sherman
Gregg	287	12,343	Longview
Grimes	770	26,106	Anderson
Guadalupe	717	21,385	Seguin
Hale	1,036	1,680	Plainview
Hall	868	1,670	Memphis
Hamilton	858	13,520	Hamilton
Hansford	860	167	Hansford

NAME	AREA (Square Miles)	POPULATION (Twelfth Census)	COUNTY SEAT
Hardeman	532	3,634	Quanah
Hardin	844	5,049	Kountze
Harris	1,761	63,786	Houston
Harrison	873	31,878	Marshall
Hartley	1,460	377	Channing
Haskell	843	2,637	Haskell
Hays	647	14,142	San Marcos
Hemphill	860	815	Canadian
Henderson	940	19,970	Athens
Hidalgo	2,328	6,837	Hidalgo
Hill	1,006	41,355	Hillsboro
Hockley	977	44	
Hood	436	9,146	Granbury
Hopkins	666	27,950	Sulphur Springs
Houston	1,192	25,452	Crockett
Howard	888	2,528	Bigspring
Hunt	888	47,295	Greenville
Hutchison	850	303	Plemons
Irion	800	848	Sherwood
Jack	858	10,224	Jacksboro
Jackson	888	6,094	Edna
Jasper	977	7,138	Jasper
Jeff Davis	1,922	1,150	Fort Davis
Jefferson	1,109	14,239	Beaumont
Johnson	740	33,819	Cleburne
Jones	900	7,053	Anson
Karnes	740	8,681	Karnes City
Kaufman	932	33,376	Kaufman
Kendall	613	4,103	Boerne
Kent	777	899	Clairemont
Kerr	1,210	4,980	Kerrville
Kimble	1,302	2,503	Junction
King	928	490	Guthrie
Kinney	1,269	2,447	Brackettville
Knox	947	2,322	Benjamin

NAME	AREA (Square Miles)	POPULATION (Twelfth Census)	COUNTY SEAT
Lamar	903	48,627	Paris
Lamb	1,021	31	
Lampasas	755	8,625	Lampasas
Lasalle	1,707	2,303	Cotulla
Lavaca	992	28,121	Hallettsville
Lee	666	14,595	Giddings
Leon	1,066	18,072	Centerville
Liberty	1,162	8,102	Liberty
Limestone	987	32,573	Groesbeck
Lipscomb	850	790	Lipscomb
Live Oak	1,123	2,268	Oakville
Llano	977	7,301	Llano
Loving	873	33	
Lubbock	982	293	Lubbock
Lynn	821	17	
McCulloch	1,110	3,960	Brady
McLenman	1,080	59,772	Waco
McMullen	1,180	1,024	Tilden
Madison	488	10,432	Madisonville
Marion	384	10,754	Jefferson
Martin	900	332	Stanton
Mason	968	5,573	Mason
Matagorda	1,135	6,097	Bay City
Maverick	1,332	4,066	Eagle Pass
Medina	1,284	7,783	Hondo
Menard	888	2,011	Menardville
Midland	972	1,741	Midland
Milam	1,044	39,666	Cameron
Mills	604	7,851	Goldthwaite
Mitchell	807	2,855	Colorado
Montague	976	24,800	Montague
Montgomery	1,066	17,067	Conroe
Moore	885	209	Dumas
Morris	278	8,220	Daingerfield
Motley	984	1,257	Matador

NAME	AREA (Square Miles)	POPULATION (Twelfth Census)	COUNTY SEAT
Nacogdoches	962	24,663	Nacogdoches
Navarro	1,136	43,374	Corsicana
Newton	903	7,282	Newton
Nolan	828	2,611	Sweetwater
Nueces	2,460	10,439	Corpus Christi
Ochiltree	864	267	Ochiltree
Oldham	1,470	349	Tascosa
Orange	392	5,905	Orange
Palo Pinto	971	12,291	Palopinto
Panola	814	21,404	Carthage
Parker	888	25,823	Weatherford
Parmer	873	34	
Pecos	8,312	2,360	Fort Stockton
Polk	1,110	14,447	Livingston
Potter	874	1,820	Amarillo
Presidio	3,970	3,673	Marfa
Rains	252	6,127	Emory
Randall	872	963	Canyon
Reagan	1,050		Stiles
Red River	1,061	29,893	Clarksville
Reeves	2,610	1,847	Pecos
Refugio	802	1,641	Refugio
Roberts	860	620	Miami
Robertson	913	31,480	Franklin
Rockwall	171	8,531	Rockwall
Runnels	1,073	5,379	Ballinger
Rusk	915	26,099	Henderson
Sabine	577	6,394	Hemphill
San Augustine	570	8,434	San Augustine
San Jacinto	636	10,277	Coldspring
San Patricio	700	2,372	Sinton
San Saba	1,150	7,569	San Saba
Schleicher	1,355	515	
Scurry	821	4,158	Snyder
Shackelford	926	2,461	Albany

NAME	AREA (Square Miles)	POPULATION (Twelfth Census)	COUNTY SEAT
Shelby	814	20,452	Center
Sherman	850	104	Coldwater
Smith	984	37,370	Tyler
Somervell	200	3,498	Glenrose
Starr	2,510	11,469	Riogrande
Stephens	926	6,466	Breckenridge
Sterling	821	1,127	Sterling City
Stonewall	777	2,183	Aspermont
Sutton	1,517	1,727	Sonora
Swisher	850	1,227	Tulia
Tarrant	900	52,376	Fort Worth
Taylor	900	10,499	Abilene
Terry	828	48	Brownfield
Throckmorton	821	1,750	Throckmorton
Titus	421	12,292	Mount Pleasant
Tom Green	1,503	6,804 ¹	San Angelo
Travis	1,036	47,386	Austin
Trinity	704	10,976	Groveton
Tyler	925	11,899	Woodville
Upshur	587	16,266	Gilmer
Upton	1,190	48	
Uvalde	1,579	4,647	Uvalde
Valverde	3,034	5,263	Delrio
Van Zandt	877	25,481	Canton
Victoria	883	13,678	Victoria
Walker	754	15,813	Huntsville
Waller	510	14,246	Hempstead
Ward	858	1,451	Barstow
Washington	568	32,931	Brenham
Webb	3,421	21,851	Laredo
Wharton	1,137	16,942	Wharton
Wheeler	851	636	Mobeetie
Wichita	606	5,806	Wichita Falls

¹ Including Reagan county.

NAME	AREA (Square Miles)	POPULATION (Twelfth Census)	COUNTY SEAT
Wilbarger	932	5,759	Vernon
Williamson	1,169	38,072	Georgetown
Wilson	784	13,961	Floresville
Winkler	888	60	
Wise	843	27,116	Decatur
Wood	688	21,048	Quitman
Yoakum	840	26	
Young	821	6,540	Graham
Zapata	1,269	4,760	Zapata
Zavalla	1,328	792	Batesville

NOTE. By legislative enactment, approved April 8, 1905, the southern portion of Pecos county was set apart as an unorganized county under the name of Terrell, thus making the number of counties in the state 245.



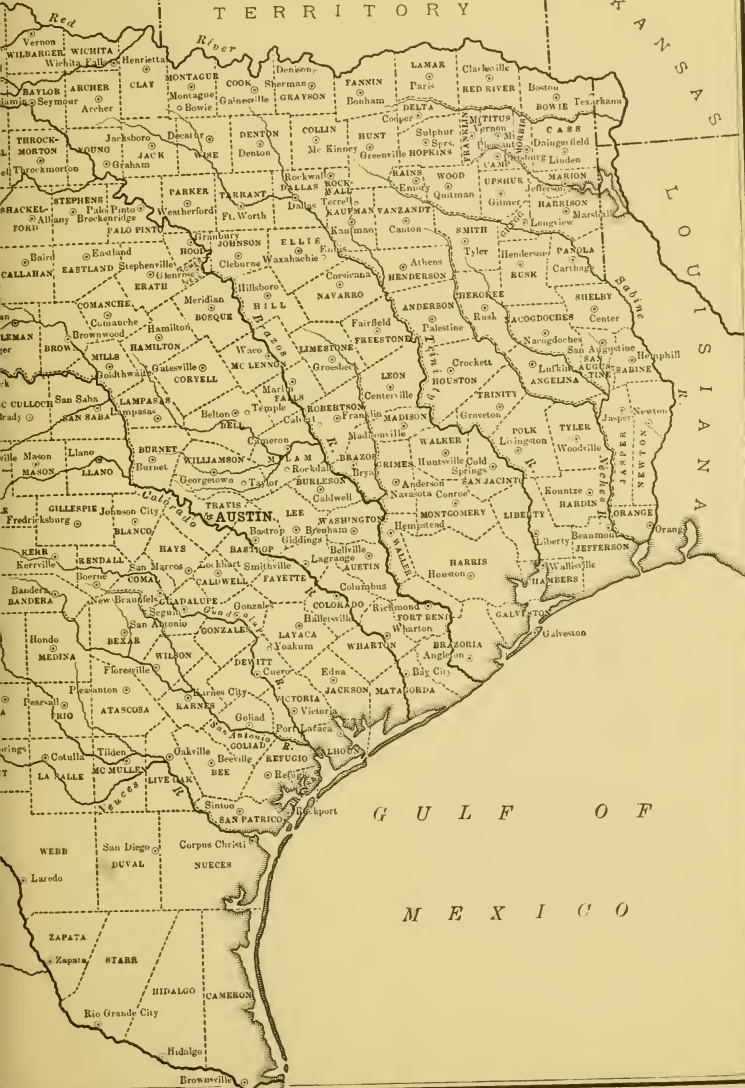
FIG. 133. Co

OKLAHOMA

INDIAN
TERRITORY

ARKANSAS

LOUISIANA



MAP OF TEXAS

INDEX

- Abilene, 213.
- Adder, Spreading, 74.
- Agates, 110.
- Agricultural and Mechanical College, 139.
- Agricultural products, miscellaneous, 90.
- Agriculture, 83.
- Alamo, fall of the, 128.
- Alamo Plaza, San Antonio, 160.
- Alligator, 72.
- Alluvial soil, 30.
- Altered rocks, 6, 8.
- Amphibians, 72.
- Angelina river, 31.
- Anglo-American, 122.
- Animals, 63.
- Animals and plants, characteristic, 62.
- Anolis, Carolina, 72.
- Archæan system, 14.
- Area of Texas, 3.
- Arid conditions, 39.
- Armadillo, Nine-Banded, 65.
- Artesian springs, 38.
- Artesian water, 36.
- Artesian water area, 36.
- Artesian water-bearing strata, 36.
- Artesian wells, 36; Bosque farm, 36; Denton, 38; Houston county, 38; Marlin, 37; Fort Worth, 38; Waco, 38.
- Arthropods, 81.
- Asphaltum, 102.
- Asylums, insane, 148, 185, 201.
- Austin, 4, 20, 183; industries of, 185; railroads of, 186; rainfall of, 40; Capitol at, 183; university at, 185.
- Austin College, 145, 194.
- Austin lake, 32.
- Austin marble, 110.
- Austin, Moses, 124.
- Austin, Stephen F., 124, 128; arrest of, 126; letter of, 126.
- Austin white lime, 106.
- Austin's colony, 124.
- Austral region, 60, 61.
- Austroriparian division of lower Sonoran zone, 62.
- Available school fund, 135.
- Bailey county, population of, 4, 217.
- Bailey, Florence Merriam, quoted, 67.
- Bailey, Vernon, quoted, 69.
- Bars, 18.
- Basalt, 7.
- Bass, Large-Mouthed Black, 78.
- Bassaridæ, 67.
- Bat, 66.
- Baylor Female College, 145, 210.
- Baylor University, 145, 187.

- Bear, Black, 67.
Beaumont, 4, 194; industries of, 195; railroads of, 194.
Beaumont oil field, 100; output of, 102.
Belton, 210.
Bienville, Sieur de, 122.
Bison, American, 66.
Black Prairie, 20; altitude of, 20; soil of, 29.
Blackwell, Enid and Texas Railway, 119.
Blind, Institutions for the, 148, 185.
Blinn Memorial College, 145, 202.
"Blue northerners," 45.
Blue Peter, 71.
Bob White, Texas, 70.
Bohemian population, 154.
Boll Weevil, Mexican, 63, 81.
Bonham, 5, 204.
"Bonnet Martyr," 71.
Boreal region, 60.
Boundaries of Texas, 2; natural, 3; surveyed, 3.
Boundary, Louisiana-Texas, 123.
Bowie, 215.
Bowie, Colonel James, 164.
Brackenridge Park, San Antonio, 160.
Brant, 71.
Bray, Dr. William L., cited, 54.
Brazos bottom, 30.
Brenham, 202.
Brick, 107.
Broom corn, 90.
Brownsville, 5, 201.
Brownwood, 209.
Bryan, 211.
Buffalo Bayou, Brazos and Colorado Railway, 112.
Buffalo Bird, 68.
Building stones, 108.
Burleson, Dr. R. C., 135.
Burleson, General Edward, 126.
Burnet, David G., 128, 132.
Bustamante, 125.
Buzzard, Mexican, 69; Turkey, 70.
Caddo lake, 32.
Callahan divide, 21.
Calvert, 213.
Cambrian system, 13.
Cameron, 213.
Canada Goose, 71.
Cane Belt Railroad, 118.
Cane, sugar, 90.
Capitol granite, 14.
Capitol, state, 183.
Caracara, Audubon, 69.
Carboniferous system, 13.
Cardinal, 68.
Carolina Dove, 70.
Carr-Burdette Christian College, 145, 194.
Cat, channel, 78; mud, 78.
Catfish, 78.
Cattle, 93.
Cedars, 55, 56.
Cement rocks, 106.
Cements, 106.
Central basin, 21; drainage of, 31; relief of, 22; soil of, 30.
Cereals, 84.
Chalk, 7.
Chaparral, 59.
Chaparral Cock, 69.
Chicago, Rock Island and Gulf Railway, 119.
Chickens, 94.
Chinati mountains, 28.

- Chisos mountains, 25.
 Cinnabar, 104.
 Civet Cat, 67.
 Claims, French and Spanish, 121.
 Clays, 107.
 Clear fork of Brazos river, 32.
 Clear lake, 32.
 Cleburne, 5, 199.
 Cline, Dr. I. M., quoted, 48.
 Coach-whip, 74.
 Coal, carboniferous, 96; cretaceous, 98.
 Coal Company, Texas and Pacific, 96.
 Coal fields, Brazos, 98; Colorado, 98; Nueces or Eagle Pass, 98.
 "Coal measures," 13.
 Coal mining, near Bridgeport, 96; near Rockcreek, 96; near Strawn, 96; at Thurber, 96.
 Coal seam, No. 1, 96; No. 7, 96.
 Coast prairie, vegetation of, 58.
 Coastal plain, 15; drainage of, 31; soils of, 29.
 Coastal slope, drainage of, 31.
 Cold waves, 44.
 College, Agricultural and Mechanical, 139; Baylor Female, 145, 210; Bishop, 199; Burleson, 201; Carlton, 204; Daniel Baker, 209; Howard Payne, 209; of Industrial Arts for Young Women, 138; Texas Female, 205; Wiley, 199.
 Colleges, denominational, 144.
 Colony, Austin's, 124.
 Colorado river, 31, 34.
 Colored population, 150.
 Common snipe, 71.
 Concepción, battle of, 126.
 Confederate Home, 148.
 Conglomerate, 13.
 Conventions of colonists, 125.
 Coot, American, 71.
 Cope, Professor Edward, quoted, 73, 74, 75.
 Copper, 105.
 Copperhead, 75.
 Copper ore, 105.
 Corazones mountains, 25.
 Corn crop, 84.
 Corn-producing counties, 84.
 Coronal Institute, 145.
 Corpus Christi, 206.
 Corsicana, 5, 196; oil wells at, 102, 196.
 Cos, General, 126.
 Cotton, 83.
 Cottonmouth, 76.
 Cotton-seed oil, 84.
 Cotton-seed products, 84.
 Cones, Dr. Elliott, quoted, 68, 69, 70.
 Counties, areas of, 217-224; county seats of, 217-224; list of, 217-224; number of, 4, 224; organized, 4; population of, 217-224; unorganized, 4, 224.
 Courts, Civil Appeals, 131; Commissioners', 132; County, 132; Criminal Appeals, 131; District, 131; Justices', 132; Supreme, 131.
 Cowbird, or Cow Blackbird, 68.
 Cows, milch, 93.
 Coyote, 67.
 Cretaceous coal, 98.
 Cretaceous system, 12.
 Crocodilian, 72.
 Crockett, 215.
 Crop reporter, 84, 85, 87.
 Cross timbers, 20, 55.
 Crow Duck, 71.

- Crustaceans, 81.
Cuero, 212.
Cypress, 49, 55.
- Dallas, 4, 20, 164; industries of, 167; location of, 167; schools of, 168; railroads of, 168, 169; trade of, 167.
- Dallas, Cleburne and Southwestern Railway, 119.
- Dallas county, population, 4, 218.
- Daniel Baker College, 145, 209.
- Davis mountains, 25, 27.
- Deaf and Dumb Asylum, 148, 185.
- Deaf, Dumb and Blind Institution for Colored Youths, 148, 185.
- Deer, Texan or Fan-Tailed, 66.
- De León, 121.
- Delaware mountains, 13.
- Delrio formation, 12.
- Delta of Trinity river, 17.
- Delta shore lines, 17.
- Denison, 4, 192; railroads of, 192.
- Denison, Bonham and New Orleans Railroad, 118.
- Denominational colleges, 144.
- Denton, 208.
- Denver System, 119.
- Departments of government, 130.
- Deposits, nonmarine, 8; sea, 8.
- Diablo mountains, 13, 27.
- Distributaries of Trinity river, 17, 18.
- Distribution of rainfall, 39.
- Drainage of Central basin, 31; of Coastal plain, 31; kinds of, 31; of older portions of the Coastal slope, 31; of plateaus, 32; of Rocky mountains, 32.
- Dry northers, 45.
- Ducks, 94.
- Eagle lake, 32.
- Eagle mountains, 28.
- Earthenware, 107, 108.
- East Texas timber, 49, 58.
- Education, 134.
- Edwards plateau, 23; altitude of, 24; forest growth of, 55; rocks of, 8; soil of, 30.
- Egret, Little White, 71.
- Eleemosynary institutions, 148.
- El Paso, 4, 187; altitude of, 189; exports and imports of, 189; irrigation near, 191; railroads of, 191; rainfall of, 42.
- El Paso county, area of, 4, 219.
- Emory, Mount, 27.
- "Empire State," 3.
- English population, 155.
- Ennis, 205.
- Eocene system, 11.
- Epileptic colony, 148, 213.
- Espantosa lake, 32.
- Evermann and Kendall, quoted, 78.
- Executive department, 131; officers, 131.
- Exogyra arietina, 12.
- Fannin, Captain J. W., 128, 164.
- Fauna, 63; of the lower Rio Grande, 64.
- Fertilizers, 110.
- Finlay mountains, 28.
- Fire brick, 108.
- Fishes, 78.
- Fishing industry, 80.
- Flounder, southern, 80.
- Forage, 90.
- Foraminifers, 7, 12.
- Foreign-born population, 153.

- Forest growths of Edwards plateau, 55; of Trans-Pecos mountains, 56.
 Forested area, 19; soils of, 29; topography of, 19.
 Fort Clark, rainfall at, 42.
 Fort Davis, rainfall at, 42.
 Fort Elliott, rainfall at, 42.
 Fort Saint Louis, 121.
 Fort Sam Houston, 162.
 Fort Worth, 4, 179; industries of, 181; railroads of, 179.
 Fort Worth and Denver City Railway, 119.
 Fort Worth and Rio Grande Railway, 119.
 Fort Worth University, 145.
 Franklin, 187.
 "Frisco" System, 119.
 Frog, Horned, 73.
 Fruit and vegetables, 87.

 Gainesville, 5, 198.
 Galveston, 4, 173; railroads of, 174; rainfall at, 40; sea wall at, 176; shipping facilities of, 174; trade of, 178.
 Galveston, Harrisburg and San Antonio Railway, 115.
 Galveston, Houston and Henderson Railroad, 112, 117.
 Galveston, Houston and Northern Railway, 117.
 Galveston and Red River Railroad, 112.
 Galveston storm, 46.
 Garriott, Professor E. B., quoted, 46, 47.
 Garrison, Dr. George P., cited, 132.
 Gas, natural, 102.
 Gastropods, 81.

 "Gate City," 192.
 Geese, 94.
 Geography defined, 1.
 Geological map, 9.
 Geology, relations of, to physical geography, 6.
 Georgetown, 214.
 German population, 154.
 Germany, 3.
 Girls Industrial College, 138.
 Gold and silver, 105.
 Golden-Fronted Woodpecker, 69.
 Goliad, massacre at, 128.
 Gonzales, 206; cannon at, 126.
 Gould System, 117.
 Government of Texas, 130.
 Governor, 131.
 Governors of the state, 133.
 Grand lake, 32.
 Grand prairie, 20; altitude of, 21; soil of, 29.
 Granite, 7, 14; quarries, 108.
 Granite mountain, 108.
 Granites, Trans-Pecos, 108.
 Greely, General A. W., quoted, 44.
 "Green-head," 71.
 Greensand marl, 111.
 Greenville, 5, 200.
 Grimes county, soil of, 29.
 Ground Cuckoo, 69.
 Ground, neutral, 123.
 Guadalupe mountains, 13, 25.
 Guadalupe peak, 25.
 Guadalupe river, 31, 32.
 Guano, bat, 110.
 Guerrero, President, 125.
 Gulf, Beaumont and Great Northern Railway, 118.
 Gulf, Beaumont and Kansas City Railway, 118.

- Gulf, Colorado and Santa Fé Rail-
 way, 118.
 Gulf and Interstate Railway,
 120.
 Gulf slope, region of, 15; arrange-
 ment of strata in, 10.
 Gulf, Western Texas and Pacific
 Railway, 116.
 Gull, common American, 72.
 Gull, Ring-Billed, 72.
 Gutierrez, Colonel Bernardo, 123.
 Gypsum, 7, 12, 106, 111.
 Hematite, 103.
 Heron, Snowy, 71.
 Hill, Robert T., 25, 38.
 Hillsboro, 5, 202.
 History, important events in Texas,
 121.
 Houston, 4, 170; industries, 172;
 railroads, 170; schools, 172.
 Houston, East and West Texas
 Railway, 117.
 Houston, General Sam, 126, 128.
 Houston Tap, 113.
 Houston Tap and Brazoria Rail-
 road, 113.
 Houston and Texas Central Rail-
 road, 117.
 Houston and Texas Central Rail-
 way, 112.
 Home, Confederate, 148.
 Honey, 94.
 Horses, 93.
 Howard Payne College, 145, 209.
 Howell, Edwin E., 16.
 Hueco mountains, 13, 28.
 Humid conditions, 39.
 Hurricanes, 46.
 Hutson, William F., quoted, 39.
 Igneous rocks, 6, 7.
 Indianola, storm at, 46.
 Industrial Arts, College of, for
 Young Women, 138.
 Industrial College, Prairie View
 State Normal and, 138.
 Industries of Texas, 83.
 Infirmary, Seton, 185.
 Insane asylums, 148.
 Insects, 63, 81.
 International and Great Northern
 Railroad, 117.
 Invasion, Long's, 124.
 Invertebrates, 81.
 Irish population, 155.
 Iron furnaces, 103.
 Iron ores, 103.
 Irrigation, 34; Coastal plain, 35;
 Delrio, 35; Menardville, 35;
 North Concho, 35; Pecos, 35.
 Islands of Texas, 17.
 Italian population, 155.
 Jaguar, Mexican, 67.
 Jefferson, 214.
 Judicial department, 131.
 Jura-Trias system, 12.
 "Katy" System, 118.
 Kibbe, I. P., 81.
 Kildee, 70.
 Killdeer, or Killdeer Plover, 70.
 Kite, Mississippi, 69.
 Ladder-Backed Woodpecker, 69.
 Lafitte, Jean, 124.
 Lagoons, 18.
 Lakes, 32; on staked plains, 34.
 Land office, general, 183.
 Land plaster, 111.

- La Purissima Concepción Mission, 164.
- Laredo, 4, 191; railroads, 191; schools, 192; shipments, 192.
- Lark Finch, or Lark Sparrow, 68.
- La Salle, 121.
- Lava, 8.
- Lead, 105.
- Legislative department, 130.
- Legislative meetings, 131.
- Libraries, 145.
- Lieutenant governor, 130.
- Life zones, 60.
- Lignite, 11, 96, 98; Santo Tomas field, 98.
- Lignite mining, localities of, 98.
- Lime, 106.
- Limestones for building purposes, 108.
- Limestones, formation of, 7.
- Limonite, 103.
- Limpia or Davis mountains, 27.
- Little river, 31.
- Livermore, Mount, 27.
- Livestocks, statistics, 93.
- Lizards, 72; Fence, 73; Green, 72; Horned, 73; Scaly, 73; Six-Lined, 74; Texan Rock, 73.
- Llano country, 105.
- Llano Estacado, 24; soils of, 30.
- Llano group, 14.
- Loblolly or swamp pine, 52.
- Long-leaf pine forests, 51; area of, 51.
- Long's invasion, 124.
- Longview, 211.
- Louis XV, King, 122.
- Louisiana-Texas boundary, 123.
- Lower Sonoran zone, 61.
- Lumber, 51.
- McKinney, 206.
- Magee's invasion, 123.
- Magnetite, 103.
- Main University, 144.
- Mallard, 71.
- Mammals of Texas, 65.
- Manufacturing, 94.
- Manufacturing industries, 95.
- Marble, 8.
- Marble Falls, 34.
- Marlin, 213; deep well at, 214.
- Marshall, 5, 199.
- Marshall, Timpson and Sabine Pass Railway, 120.
- Massasauga, Edwards', 76.
- Matagorda peninsula, 17.
- Medical department, The University of Texas, 144, 178.
- Medina, battle of the, 124.
- Meetings of legislature, 131.
- Memphis, El Paso and Pacific Railway, 113.
- Mercury, 104.
- Merriam, C. Hart, quoted, 64.
- Mesas, 27.
- Mesquite, spread of, 58.
- Metamorphic rocks, 6, 8.
- Metamorphism, 8.
- Mexican irritation, 125.
- Mexican population, 153.
- Mexican war, 129.
- Mills, cotton-seed-oil, 84.
- Milwaukee brick, 107.
- Mineral pitch, 102.
- Mineral resources, 96.
- Mineral springs, 38.
- Missions, 121; La Purissima Concepción, 164; San Antonio de Valero, 162; San Francisco de la Espada, 164; San José de

- Aguayo, 164; San Juan de Capistrano, 164.
 Missouri, Kansas and Texas Railway, 118.
 Mitchell, J. D., cited, 75.
 Moccasin, Dry Land (Copperhead), 75; Water or Stump-Tail, 76.
 Mocking Bird, 67.
 Mohr, Dr. Charles, quoted, 51, 52.
 Mollusk shells, 12.
 Mollusks, 81.
 Mottes, 58.
 Mount Emory, 27.
 Mount Livermore, 27.
 Mountains and basins, region of, 25.
 Mountains, Chinati, 28; Chisos, 25; Corazones, 25; Davis, 27; Delaware, 13; Diablo, 13; Eagle, 28; Finlay, 28; Guadalupe, 13, 25; Hueco, 13, 28; Ord, 25; Quitman, 28; Rosillos, 25; Santiago, 25; Vieja, 28.
 Mourning Dove, 70.
 Mud Hen, 71.
 Mules, 93.
 Native population, 150.
 Natural gas, 102.
 Navasota, 209.
 Navasota river, 31.
 Neches river, 31.
 New York, Texas and Mexican Railway, 116.
 Nolan, Philip, 123.
 Nonmarine deposits, 8.
 Normal College, North Texas State, 137.
 Normal and Industrial College, Prairie View, 138.
 Normal Institute, Sam Houston, 135.
 Normal School, Southwest Texas, 137.
 North Texas State Normal College, 137.
 Northers, 44; blue, 45; dry, 45; wet, 45.
 Nueces river, 31, 32.
 Nuts, 88.
 Oat crop, 85.
 Oat-producing counties, 85.
 Oil (petroleum), 99.
 Oil at Batson, 102; at Beaumont, 100; at Corsicana, 102, 196; at Humble, 102; at Sourlake, 102.
 Oil in Bexar county, 102; in Brown county, 102; in Clay county, 102; in Nacogdoches county, 102; in Travis county, 102.
 Oil fields, Beaumont, 100; Corsicana, 102, 196.
 Oil refineries, Corsicana, 102; Houston, 173; Port Arthur, 102; Powell, 102.
 Oklahoma City and Texas Railroad, 119.
 Onions, 192.
 Onyx, golden, 110.
 Ooze, 7.
 Opal granite, 110.
 Opossum, Texas, 65.
 Orange, 209.
 Ord mountains, 25.
 Ordovician system, 13.
 Orphans' Home, Odd Fellows', 197; State, 148, 197.
 Oyster industry, 81.
 Oyster, Ram's-Horn, 12.

- Padre island, 17.
Paisano, 69.
Palestine, 5, 198.
Palm Sunday, 1836, massacre on, 128.
Paris, 5, 196.
Paris and Great Northern Railroad, 119.
Patellina texana, 7.
Peaches, 87, 88.
Peanuts, 90.
Pecan nuts, 88.
Peccary or Wild Hog, 66.
Pecos and Northern Texas Railway, 118.
Pecos river, 32.
Pecos River Railroad, 118.
Pelecypods, 81.
Pelican, 71.
Penal institutions, 148.
Peninsulas of Texas, 17.
Penitentiaries, Huntsville, 148; Rusk, 148.
Penrose, R. A. F., quoted, 58, 59.
Permanent school fund, 134.
Permian system, 13.
Perpetual school fund, 134.
Petroleum, 99.
Pine forests, destruction of, 54.
Plain, Coastal, 15.
Plantation, state, 90.
Plants of Texas, 49.
Plateaus, Edwards, 23; Stockton, 23.
Plateaus, drainage of, 32; region of, 22; vegetation of, 60.
Plover, 71.
Population, 149; colored, 150; elements of, 150; foreign-born, 153; native white, 150; prison, 148.
Population of San Antonio, 157.
Port Arthur, 102.
Post Oak country, 55.
Potato, Irish, 88.
Poultry, 94.
Prairie Dog, 66.
Prairie plains, vegetation of, 60.
Prairie View Normal and Industrial College, 138.
Prairie Wolf, or Coyote, 67.
Prairies, Black, 20; Grand, 20.
Presidents of the Republic, 132.
Pumice, 8.
Quail, Texas, 70.
Quartz, 6.
Quartzite, 8.
Quicksilver, 104; furnaces, 104; output, 104.
Rabbit, 66.
Raccoon, 67.
Racer, 74.
Railroad construction, 114.
Railroad mileage, 115, 120.
Railroad systems, 115.
Railroads, pioneer, 112.
Rainfall, 39; at Austin, 40; at Fort Clark, 42; at Fort Davis, 42; at Fort Elliott, 42; at El Paso, 42; at Galveston, 40.
Ramón, Captain Diego, 122.
Rattlesnake, Banded, 77; Diamond, 77; Dog-Faced, 78; Green, 78; Ground, 76; Prairie, 78; Texas, 77.
Readmission of Texas, 129.
Recent Rock system, 10.
"Red Beds," 13.
Redbird, 68.

- Red river, 3, 31.
 Red River, Texas and Southern Railway, 119.
 Red Snapper, 80.
 Reformatory, State, 148.
 Regions, Central basin, 21; Gulf slope, 15; mountains and basins, 25; plateaus, 22.
 Relief, Central basin, 22; classification of, 15; Texas, 15.
 Representatives, House of, 130.
 Reptiles, 72.
 Republic, Presidents of, 132.
 Republic of Texas, 128.
 Revolution, Texas, 126.
 Rice belt, 86.
 Rice crop, 87.
 Rice-producing sections, 86.
 Rio Grande, 3, 29; variations in volume, 32.
 Rio Grande plain, vegetation of, 59.
 Rivers, gradient of, 32; navigation of, 32.
 Road-Runner, 69.
 Roberts, Governor O. M., 133, 135.
 Rockdale, 98, 216.
 Rock Island System, 119.
 Rock salt, 7, 105.
 Rock systems, 9.
 Rocks, altered, 6, 8; classification of, 6; igneous, 6, 7; metamorphic, 6, 8; sedimentary, 6; Texas, 8.
 Rocks of the Black Prairie, 12; of the Grand Prairie, 12.
 Rockwall county, area, 4, 222.
 Rocky mountain, cedars, 56; drainage of, 32; pines, 56.
 Rosillo creek, battle at, 124.
 Rosillos mountains, 25.
 Sabine and Galveston Bay Railway, 114.
 Sabine lake, 3.
 Sabine river, 31.
 Saint-Denis, 121, 122.
 Saint Edward's College, 145, 185.
 Saint Louis, Brownsville and Mexico Railway, 120.
 Saint Louis, San Francisco and Texas Railway, 119.
 Saint Louis Southwestern Railway, 117.
 Saline, near Palestine, 105, 198; in Van Zandt county, 105.
 Salt, occurrence of, 105.
 Salt basin, 29, 34.
 Sam Houston Normal Institute, 135.
 San Angelo, 215.
 San Antonio, 4, 157; missions near, 162; parks of, 160; population of, 157, 158; public buildings at, 158; schools of, 160; railroads of, 162.
 San Antonio and Aransas Pass Railway, 119.
 San Antonio and Mexican Gulf Railroad, 113.
 San Antonio de Valero, mission of, 162.
 San Antonio river, 160.
 Sands, 11.
 Sandstone, 6.
 Sandstones for building purposes, 109.
 San Filipe de Austin, 125.
 San Francisco de la Espada, mission of, 164.
 San Jacinto, battle of, 128.
 San José de Aguayo, mission of, 164.
 San Juan de Capistrano, mission of, 164.

- Santa Anna, 125, 126, 128.
Santa Fé System, 118.
Santiago mountains, 25.
Santiago peak, 27.
Santo Tomas coal field, 98.
Schists, 8.
School funds, available, 135; permanent, 134; perpetual, 134.
Schools, affiliated, 134.
Scissor-Tailed Flycatcher, 69.
Screech Owl, Texas, 69.
Sea deposits, 8.
Sears, Dr. Barnas, 135.
Sedimentary rocks, 6.
Semiarid conditions, 39.
Semitropical or Gulf strip, 62.
Senate, state, 130.
Serpentine, 110.
Settlement, first, 121.
Shale, 6.
Sheep, 93.
Sherman, 4, 193; cotton-seed-oil mill, 193; educational institutions, 194; industries, 193; railroads, 193.
"Shinneries," 56.
Short-leaf pine forests, 52.
Shrimp, 81.
Sierra Diablo, 27.
Silver, 105.
Silver mine, 105.
Simmons College, 145, 213.
Skunk, 67.
Slates, 8.
Smelters, 189.
Smithville. 216.
Snake-Killer, 69.
Snakes, 74; Black, 74; Bull, 74; Coral, 75; Diamond Water, 75; Harlequin, 75; Hog-Nosed, 74; Pilot, 74; Say's Garter, 75; Say's King, 74. See also *Copperhead* and *Rattlesnake*.
Snakes, poisonous, 75.
Snipe, 71.
Snow, 44.
Snowy Heron, 71.
Soils, 29; Black Prairie, 29; Central basin, 30; Coastal plain, 29; Edwards plateau, 30; forested area, 29; Grand prairie, 29; Grimes county, 29; Llano Estacado, 30; residual, 29; transported, 29, 30; Washington county, 29.
Sorghum, 90.
Southern Kansas Railway, 118.
Southern Pacific Railway, 113.
Southern Pacific System, 115.
Southwest Texas Normal School, 137.
Southwestern University, 145, 214.
Spanish rule, 122.
Speckle-Check Woodpecker, 69.
Spindle-Top Heights, 100.
Springs, 38; Dalby, 38; Hynson's Iron mountain, 38, 199; Mineralwells, 38; Rosborough, 38, 199; Wootan Wells, 38.
Squirrel, 66.
Staked plains, 24; rocks of, 8.
Staked plains formations, 10.
State library, 147.
State of Texas, 1, 129; comparative size of, 3.
Stejneger, Leonhard, quoted, 76, 77, 78.
Stock raising, 90.
Stockton plateau, 23; rocks of, 8.
Storm at Galveston, 46; at Indianola, 46.

- Strata, 6; in Gulf slope, 10.
 Strawberries, 88.
 Sugarland, 90.
 Sulphur, 106.
 Sulphur Fork of Red river, 31.
 Sulphur springs, 210.
 Sunshine in Texas, 48.
 Swedish population, 154.
 Swift, tree, 73.
 Swine, 93.
 Systems, Archæan, 14; Cambrian, 13; Carboniferous, 13; Cretaceous, 12; Eocene, 11; Jurassic, 12; Ordovician, 13; Permian, 13; Recent and Neocene, 10.
 Taylor, 207.
 Taylor formation, 12.
 Teal, 71.
 Temperature of Texas, 43.
 Temple, 5, 200.
 Terrell, 5, 201.
 Texan Bird of Paradise, 69.
 Texarkana, 5, 203.
 Texarkana and Fort Smith Railway, 120.
 Texas, area, 3; attractive features of, 1; boundaries of, 2; cities and towns of, 4, 157, 196, 205; counties of, 4, 217; forests of, 49; governors of, 133; political divisions of, 4; republic of, 128; rocks of, 8, 9; state of, 1, 129; temperature of, 43; timber of, 48, 58; wealth of, 2.
 Texas Central Railroad, 120.
 Texas Christian University, 145, 187.
 Texas Mexican Railway, 120.
 Texas Midland Railroad, 120.
 Texas and New Orleans Railroad, 114, 116.
 Texas and Pacific Coal Company, 96.
 Texas and Pacific Railway, 117.
 Texas Railroad and Navigation Company, 112.
 Texas, Sabine Valley and Northwestern Railway, 120.
 Texas Southern Railway, 120.
 Texas Woodpecker, 69.
 Toad, Horned, 73.
 Tobacco, 90.
 Tomatoes, 88.
 Tortoise, Painted Box, 72.
 Transition zone, 61.
 Trans-Pecos forest growth, 56.
 Travis, Colonel William B., 128.
 Trinity and Brazos Valley Railroad, 120.
 Trinity river, 31; distributaries of, 17.
 Trinity sands, 37.
 Trinity University, 145, 207.
 Tropical region, 62.
 Turkeys, 94.
 Turtle Dove, 70.
 Turtles, Louisiana Mud, 72; Snapping, 72; Soft-Shell, 72.
 Tyler, 5, 198.
 University of Texas, 143; endowment of, 144; library of, 148.
 Upper Sonoran zone, 61.
 Vacancies in offices of judges, 132.
 Vegetables, 87.
 Vegetation, 49; of coast prairie, 58; of plateaus, 60; of prairie plains, 60; of Rio Grande plain, 59.

- Victoria, 208.
Vieja mountains, 28.
Vulture, Turkey, 70.
- Waco, 4, 20, 186; industries of, 186; railroads of, 187; schools and colleges of, 187.
War, Civil, 129.
Washington county, soil of, 29.
Washington County Railroad, 114.
Watermelons, 88.
Water power, 34; from Colorado river, 34; from Guadalupe river, 34; at Marble Falls, 34; at San Marcos, 34.
Waters, surface and underground, 31.
Wax, 94.
- Waxahachie, 207.
Weatherford, 205.
Weatherford, Mineral Wells and Northwestern Railway, 117.
Wet northers, 45.
Wheat crop, 84.
Wheat-producing counties, 85.
Wichita Falls Railway, 119.
Wichita Falls and Oklahoma Railway, 119.
Wilson Snipe, 71.
Winds, 45.
Wood, petrified, 12.
Wool growing, 94.
Wool-producing counties, 94.
- Yoakum, 212.
Ysleta, 121.



SEP 1 1905

LIBRARY OF CONGRESS



0 014 646 580 8

